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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 31
1918

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For 1918

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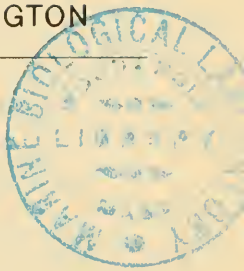
The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The Index, title page, and minutes of meetings for 1918 (pp. i–xiv; 205–210) were issued on February 14, 1919.

Vol. 31, pp. ix-xiv

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



PROCEEDINGS.

The Society meets from October to May, on alternate Saturdays, at 8 P. M.

January 12, 1918—577th Meeting.*

Assembly Hall of the Cosmos Club.†

President J. N. Rose in the chair; 38 persons present.

New members were elected as follows: E. A. Chapin, F. P. Metcalf, and Charles E. Chambliss.

The death of Katherine M. Raber was announced.

President Rose announced the membership of the Publication Committee as: C. W. Richmond, J. H. Riley, N. Dearborn, and W. L. McAtee; of the Committee on Communications as: Wm. Palmer, Alexander Wetmore, R. E. Coker, L. O. Howard and A. S. Hitchcock.

Informal communications: Gen. T. E. Wilcox, Note on the inability of camels to swim; A. S. Hitchcock, Note on plans for establishing an abstract journal of botany.

Formal communications: N. E. McIndoo, The senses of insects; Eleanor C. Allen (introduced by President Rose), Wax models of fleshy fungi; C. B. Doyle, Some agricultural and botanical features of Haiti.

January 26, 1918—578th Meeting.‡

President Rose in the chair; 62 persons present.

J. B. Norton and S. F. Blake were elected to membership.

* Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 138–140, March 4, 1918.

† The 577th to 584th meetings were held in the Assembly Hall of the Cosmos Club.

‡ Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 177–179, March 19, 1918.

Informal communications: A. Wetmore, Remarks on certain food habits of the grackle; A. S. Hitchcock, Note on Rydberg's recently issued flora of the Rocky Mountain region; Paul Bartsch, Note on a collection of Philippine shells from the Island of Luzon; L. O. Howard, Note on the utilization of acorns for the manufacture of alcohol; W. L. McAtee, Note on the behavior of ducks, geese and other birds during the recent continued cold weather in North Carolina.

Formal communications: Emerson Stringham, Notes on the speed of fishes, especially the Alewife; W. E. Safford, Natural history of Paradise Key, Florida.*

February 9, 1918—579th Meeting.†

President Rose in the chair; 36 persons present.

Informal communications: A. S. Hitchcock, Note on the feeding of gulls and pelicans at Tobago.

Formal communications: S. A. Rohwer, Notes on the nesting habits of the social wasps; R. W. Shufeldt, biological anomalies as exemplified by the collection in the Army Medical Museum.‡

February 23, 1918—580th Meeting.§

President Rose in the chair; 48 persons present.

Miss M. T. Cooke and Edmund D. Gibson were elected to membership.

Informal communications: Vernon Bailey, Exhibition and description of some new born opossums; R. W. Shufeldt, Exhibition and description of a young two-headed box tortoise; C. D. Marsh, Note on Ward and Whipple's recently issued Fresh-Water Biology.

Formal communications: O. W. Barrett, A promising new source of sugar; W. C. Kendall, Some unrecognized anatomical facts and their relation to fish-cultural practices.

March 9, 1918—581st Meeting.‖

President Rose in the chair; 30 persons present.

Miss E. E. Stevenson was elected to membership.

* To be published in Proc. U. S. Nat. Mus.

† Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 211, 212, April 4, 1918.

‡ Medical Record, April 13, 1918.

§ Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 212–214, April 4, 1918.

‖ Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 296–298, May 4, 1918.

Informal communications: T. S. Palmer, Note on the systematic feeding of quail in the City of Washington during the past winter; R. W. Shufeldt, Exhibition of and remarks on an x-ray picture of double-headed box tortoise, and living specimens of whip-tailed scorpion.

Formal communications: John T. Zimmer, An instinctive feeding habit of young herons*; E. P. Churchill, Jr., The life history of the blue crab; R. H. True, Notes on the early history of the pecan in America.

March 23, 1918—582d Meeting.†

President Rose in the chair; 65 persons present.

Formal communication: Edmund Heller, The Chinese Borderland of Tibet and Burma.

April 6, 1918—583d Meeting.‡

President Rose in the chair; 37 persons present.

Miss Crystal Thompson and Norman A. Wood were elected to membership.

Informal communications: W. L. McAtee, Note on and exhibition of a fish hook in the stomach of a merganser; Gen. T. E. Wilcox, Remark on an arrow head found in the stomach of a grouse; L. O. Howard, Notes on attempts to limit the spread of the pink boll-worm; Wm. Palmer, Remarks on and exhibition of some fossil bones and teeth from Calvert Cliff, near Chesapeake Beach, Md.

Formal communications: C. D. Marsh, The cause of milk sickness or trembles; J. W. Gidley, Segregation, an important factor in evolution, with its special bearing on the origin and distribution of mammals.

April 20, 1918—584th Meeting.§

President Rose in the chair; 35 persons present.

Informal communications: Gen. T. E. Wilcox and Dr. L. O. Howard made reference to Roosevelt's A Booklover's Holiday

* Proc. Biol. Soc. Washington, vol. 31, p. 94, June 29, 1918.

† Abstracts in Journ. Washington Acad. Sci., vol. 8, p. 298, May 4, 1918.

‡ Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 330, 331, May 19, 1918.

§ Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 374, 375, June 4, 1918.

in the Open, and to a visit of its author to one of the Society's meetings when he was Assistant Secretary of the Navy.

Formal communications: Alexander Wetmore, Lead poisoning in waterfowl; A. S. Hitchcock, Generic types; W. W. Eggleston, Thomas Nuttall's trip to Oregon in 1834, with notes on the route.

May 4, 1918—585th Meeting.*

Meeting House of Friends' School, 1809 I Street N. W.

President Rose in the chair; 26 persons present.

Informal communications: Paul Bartsch, Remarks on a rhododendron thicket; nesting of starlings and a terrestrial burrowing spider; Alexander Wetmore, Remarks on and exhibition of fragment of bone of Puffinus from Calvert Cliffs, Chesapeake Beach, Maryland.

Formal communications: Martha Brewer Lyon, Fauna of the human eye; Maynard M. Metcalf, Opalina and the origin of the Ciliata.

May 18, 1918—586th Meeting.†

Meeting House of Friends' School, 1809 I Street N. W.

President Rose in the chair; 50 persons present.

Rudolph Martin Anderson, W. C. Henderson, Ralph V. Chamberlin, J. R. de la Torre Bueno and Amos W. Butler were elected to membership.

Informal communication: W. L. McAtee called attention to the appearance of Bulletin No. 1, A Sketch of the Natural History of the District of Columbia, together with an indexed edition of the U. S. Geological Survey's 1917 Map of Washington and Vicinity.

Formal communication: Dr. J. C. Merriam gave an illustrated lecture on Cave Hunting in California.

Owing to the prevalence of the pandemic of influenza and the desire of the health authorities that public gatherings be omitted, no meetings of the Society were held during October, and only one in November.

* Abstracts in Journ. Washington Acad. Sci., vol. 8, pp. 413, 414, June 19, 1918.

† Abstracts in Journ. Washington Acad. Sci., vol. 8, p. 542, September 19, 1918.

November 30, 1918—587th Meeting.*

Carnegie Institution, 16th and P Streets N. W.

Vice-President Hopkins in the chair; 35 persons present.

The deaths of Douglas C. Mabbott, killed in battle in France, D. E. Lantz and Frederick Knab, were noted.

Informal communications: L. O. Howard, Remarks on a noxious European snail recently discovered in California; T. S. Palmer, Notes on the recent meeting of the American Ornithologists' Union; on birds of paradise in the New York Zoological Society's Park, and on scarcity of seed food for caged birds; R. W. Shufeldt, Remarks on preserving fluids.

Formal communications: A. S. Hitchcock, Some notes on the botany of Long's Peak, Colorado; M. W. Lyon, Jr., Influenza.

December 14, 1918—588th Meeting.†

THIRTY-NINTH ANNUAL MEETING.

Carnegie Institution, 16th and P Streets N. W.

President Rose in the chair; 18 members present.

The following were elected to membership: J. Chester Bradley, Frank L. Burns, W. Lee Chambers, C. I. Clay, Charles B. Cory, Maunsell S. Crosby, Frank S. Daggett, Charles C. Deam, H. M. Denslow, Philip Dowell, Morton J. Elrod, George L. Fordyce, Henry W. Fowler, Albert O. Garrett, H. Gifford, Arthur H. Helme, Charles W. Howard, V. A. Huard, Lynds Jones, Frederic C. Kennard, John Dryden Kuser, Joseph Mailliard, Alexander Howard MacKay, Frank T. McFarland, Edward A. McIlhenny, William B. Mershon, Robert Thomas Moore, James Alexander Munro, E. Lawrence Palmer, Raymond J. Pool, Charles Theodore Ramsden, Samuel F. Rathbun, Joseph Francis Charles Rock, C. Otto Rosendahl, Aretas A. Saunders, W. E. Saunders, Althea R. Sherman, Charles A. Shull, Frank Smith, P. A. Taverner, Reginald Charles Treherne, Harry B. Weiss and C. B. Williamson.

Annual reports of officers and committees were received.

Election of officers for the year 1919 resulted as follows:

President: H. M. Smith.

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* Abstracts in Journ. Washington Acad. Sci., vol. 9, pp. 54, 55, January 19, 1919.

† Abstracts in Journ. Washington Acad. Sci., vol. 9, p. 55, January 19, 1919.

Vice-Presidents: A. D. Hopkins, Vernon Bailey, N. Hollister, A. S. Hitchcock.

Recording Secretary: M. W. Lyon, Jr.

Corresponding Secretary: W. L. McAtee.

Treasurer: Ned Dearborn.

Members of the Council: J. W. Gidley, Wm. Palmer, E. A. Goldman, Alexander Wetmore, H. C. Oberholser.

President Smith was nominated as one of the Vice-Presidents of the Washington Academy of Sciences.

President Smith deferred designating the membership of the committees on publication and on communications until the next regular meeting of the Society.

Vol. 31, pp. 1–2 February 21, 1918

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW FLYING-SQUIRREL FROM THE PHILIPPINE ISLANDS.

BY WILFRED H. OSGOOD.

In a collection of mammals recently received by the Field Museum of Natural History are two flying squirrels from the Philippine Island of Bancalan. This island is of small size and lies in North Balabac Straits between Balabac and Palawan. No natural history collections have been reported from it heretofore, but as indicated by its location and by the present specimens, its faunal relations are doubtless with Palawan. These specimens, although closely similar to *Sciuropterus nigripes* of Palawan, differ from it, chiefly in size, to an extent sufficient to warrant their separate recognition. Comparison has been made with four specimens of *S. nigripes* from Iwahig, Palawan, kindly loaned by the American Museum of Natural History through Dr. J. A. Allen.

Sciuropterus nigripes elassodontus, subsp. nov.

Type from Bancalan Island, North Balabac Strait, Philippine Islands. No. 21,774, Field Museum of Natural History. Young adult male. Collected July 16, 1916, by C. M. Weber.

Characters.—General characters as in *Sciuropterus nigripes* Thomas;* size smaller throughout; skull and teeth relatively small.

Color of type.—Upper parts grayish hair brown overlaying a deep neutral gray basal color; top of head slightly more grayish but essentially like back; patagium rather thinly haired and colored like back; sides of nape bordered by dull grayish continuous with sides of neck and postauricular region; under parts chiefly with a neutral gray basal color overlaid by pale creamy, a few scattered and irregular areas wholly

* Ann. & Mag. Nat. Hist. (6), XII, p. 30, July, 1893.

cream-colored or whitish; cheeks, chin, sides of neck and front of breast dull mouse gray; ears dusky; feet brownish black; tail in proximal third wood brown slightly, or not at all, tipped with black on under side and rather broadly tipped with it, at least medially, on upper side; tail in distal two-thirds brownish black, the hairs more or less brownish fawn at their bases.

Skull and teeth.—Skull similar in general to that of *Sciuropterus nigripes*, but smaller; nasals rather contracted posteriorly and definitely exceeding premaxillae; interparietal with transverse dimension exceeding longitudinal; fronto-parietal suture acutely emarginate; front edge of coronoid process unbeaded; incisor teeth decidedly more slender than in *S. nigripes;* cheekteeth essentially as in *nigripes*, but nearly ten per cent smaller.

Measurements.—Total length, 500; tail, 250; hind foot, 45; ear, 25. Skull of type: Occipito-nasal length, 45.7; basal length, 42.5; zygomatic breadth, 28; length of nasals, 14.5; anterior breadth of nasals, 8.1; posterior (least) breadth of nasals, 3.6; length of palate, 21.5; diastema, 8.8; upper cheekteeth, 10.8; length of large premolar, 2.5.

Remarks.—The obvious derivation of the above-described form from *S. nigripes* seems to warrant its association with that species as a race. Of the two specimens examined, both have the teeth practically unworn and therefore may not represent the maximum size, but comparison has been made with specimens of *nigripes* of corresponding and less advanced stages of maturity. Aside from the present form and *S. nigripes*, the only other flying squirrel known from the Philippine Islands is *Sciuropterus crinitus* Hollister, which is from Basilan Island and is referred to a different subgenus.

Vol. 31, pp. 3–4 February 21, 1918

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW FLYING-SQUIRREL FROM EASTERN ASIA.

BY GERRIT S. MILLER, JR.

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Among some mammals which Mr. Copley Amory, Jr., collected for the National Museum in eastern Asia during the winter of 1914–15 is a flying-squirrel that represents a form distinct from any that has hitherto been described. A short account of Mr. Amory's work was published in the Smithsonian Miscellaneous Collections, vol. 66, No. 3, pp. 46–51, May 27, 1916, but no general report on his collection of mammals has yet been written. The flying-squirrel may be named and described as follows :

Pteromys volans incanus, subsp. nov.

Type.—Adult female (skin and skull; teeth moderately worn), No. 200,613, U. S. National Museum. Collected at Verkhne Kolymsk, East Siberia, April 24, 1915, by Copley Amory, Jr. Original number, 374.

Diagnosis.—Similar to *Pteromys volans volans*, but general color of upperparts a clear gray almost without trace of buffy suffusion, and tail without noticeable clouding of black.

Color.—Bases of hairs everywhere deep neutral-gray; on the upperparts and sides this is overlaid by a whitish gray with a barely perceptible tinge of buff, the two colors blending into a general effect that is near the pallid mouse-gray of Ridgway. Muzzle, cheeks, underparts and area behind ear white with a faint buffy tinge. Edge of ear and dorsum of manus and pes clouded with dusky. Tail nearly concolor with back, but slightly more tinged with buffy along sides and at tip above, and inconspicuously clouded by a sprinkling of long black hairs both above and below.

Skull and teeth.—The skull resembles that of *Pteromys volans volans*. It differs from that of the Chinese *P. buechneri* in its greater size and in the longer narrower form of the interpterygoid space. The teeth show no special peculiarities.

Measurements.—Head and body, 178; tail, 111; hind foot, 38 (36); condylobasal length of skull, 38.3 (36.2)*; zygomatic breadth, 25.7 (24.2); mastoid breadth, 20.2 (19.0); interorbital constriction, 8.8 (9.0); rostral breadth at front of nasals, 6.5 (6.8); nasal, 13.5 (12.8); diastema, 8.0 (8.2); mandible, 24.0 (23.2); maxillary toothrow, 7.4 (7.4); mandibular toothrow, 7.2 (7.2).

Remarks.—In his field notes, Mr. Amory writes of the flying-squirrel: "Not found south of the Verkhne Kolymsk region. Last year it was scarce, like the tree squirrel, but usually it is plentiful on the upper Kolyma. This beautiful little skin is too tender to have a commercial value, and the Yakut and Russian merchants do not trade it. But it has a local value of ten kopeks, and is sometimes made up into shirts or parkas."

Specimen examined.—The type.

* Cranial measurements in parenthesis are those of an adult male *Petromys volans volans* from Finland, No. 1. 6. 9. 1 British Museum (see Cat. Mamm. Western Europe Brit. Mus., p. 946. November, 1912.

Vol. 31, pp. 5–8 February 27, 1918

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF NEW SPECIES OF SHELLS CHIEFLY FROM MAGDALENA BAY, LOWER CALIFORNIA.

BY W. H. DALL.

In the course of a revision of the West American collection in the National Museum the following species appeared to be undescribed:

? **Scintilla chloris,** new species.

Shell of a pale green color, translucent, with more or less evident paler rays, the umbo darker than the rest of the disk; inequilateral, rather compressed, the posterior end wider, longer, rounded; the anterior end shorter, attenuated; the exterior polished, with slight concentric irregularities of growth, and extremely faint, partly obsolete radial striulæ; hinge with a long amphidetic ligament in front of which in the left valve is a single noduliform denticle, and behind which is a feebly indicated lateral lamella; the scar of the ligament is long and narrow, there is no evident division into ligament and resilium which might perhaps be visible in a perfectly fresh specimen. The interior of the disk is so polished that the muscular and pallial scars are not distinguishable, but under the microscope a sparse punctation can be made out; the margins are entire. Length of valve, 9.0; length of the part in front of the vertical from the umbo, 3.0; height, 6.0; double diameter of the left valve, 2.0 mm.

Habitat.—Magdalena Bay, L. Cal., collected by C. R. Orcutt. U. S. Nat. Mus. Cat. No. 218179.

Two left valves were obtained. The shell is not absolutely identifiable with *Scintilla* as defined, but seems nearest to that genus, so until it is possible to describe the characters of both valves it seems best to leave it with that genus.

Macron orcutti, new species.

Shell of moderate size, solid, flesh colored under a brown villous periostracum, the aperture white, the throat pale purple; nucleus lost, remaining whorls five, moderately rounded, the suture distinct but not

channelled; the general form Buccinoid; the surface finely, sharply uniformly closely spirally striated; toward the base there are about four sharp distant stronger grooves, the posterior larger than the rest and terminating at the outer lip in a short spur or tooth; siphonal fasciole strong, twisted, keeled; aperture longer than the spire, obovate, with a strong subsutural callus continued into the whorl as a spiral ridge; inner lip and pillar with a smooth arcuate coat of white callus; outer lip with about 15 internal liræ; canal short, deep, recurved. Length of shell, 36; of last whorl, 32; of aperture and canal, 26; max. diameter, 21 mm.

Habitat.—Magdalena Bay, L. Cal., C. R. Orcutt. U. S. Nat. Mus. Cat. No. 218185.

It was a surprise to find a third species of *Macron* on the coast, especially one of such size, and conspicuously distinct from any of the mutations of *M. aethiops*. Two specimens were obtained.

Phenacolepas magdalena, new species.

Shell white with a yellowish periostracum, nearly orbicular; anterior slope long, convexly arched, posterior slope shorter, straight; apex minute, pointed; sculpture of faint close radiating threads uniformly disposed but not crenulating the margin; these are crossed by low concentric sculpture cutting the threads into nodules; interior white, the lateral muscular impressions very broad; length of shell, 15.5; apex in front of posterior edge, 3.5; breadth, 14.5; height, 5.0 mm.

Habitat.—Magdalena Bay, L. Cal., C. R. Orcutt, U. S. Nat. Mus. Cat. No. 217907.

This is the first typical species of the genus decribed from West America. *Crepidula osculans* C. B. Adams, from Panama, afterward named *Scutella navicelloides* by Carpenter, is the only other species of the family on record from this coast, and as that appears to have a sort of ledge inside the posterior edge and a terminal apex (hence the "*Crepidula*") it can hardly belong to the group typified by *P. crenulatus* Broderip.

Marginella californica Tomlin, new var. **parallela.**

Shell resembling the Californian race of the species but uniformly smaller. The typical form has a faint narrow spiral brown band at the suture, then a pale band, then a broad yellow-brown band, a narrower pale band, a second broad brown band beyond which the shell is pale to the anterior end;—when the shell is not unicolorate. The present variety has the broad brown bands represented by narrow dark brown paired lines with a faint flush of brown between them, giving the shell a very different aspect from the type.

Length of average *californica*, 8.5; breadth, 4.0 mm.
" " " var. *parallela*, 6.7 " 3.0 "

Habitat.—Magdalena Bay, L. Cal., C. R. Orcutt. U. S. Nat. Mus. Cat. No. 217843.

Numerous specimens were collected.

? **Trichotropis (Provanna) lomana,** new species.

Shell thin, white under a dull smooth olive-green periostracum, decollate but indicating more than three whorls; suture deep but not channelled, whorls well rounded; axial sculpture on the last whorl of about twenty slightly arcuate ribs, with subequal interspaces, ceasing abruptly at the periphery; on the preceding whorls these extend from suture to suture; on the base the axial sculpture is reduced to inconspicuous incremental lines; spiral sculpture, behind the periphery, of obscure close-set threads only visible in the interspaces; in front of the periphery and between it and the canal are four or five strong cords with narrower deep interspaces, slightly crenulating the thin anterior margin of the outer lip; aperture rounded, throat white, showing the impress of the external sculpture; body and inner lip with a thin white layer of callus; pillar arcuate, angulate at the extremity; canal very short and rather wide. Length of (decollate) two and a half whorls, 7.0; of last whorl, 6.0; of aperture, 4.0; max. diameter, 5.5 mm.

Habitat.—Off Point Loma, San Diego Co., Cal., at station 4354, U. S. Bureau of Fisheries in 650 fathoms, mud, bottom temperature, 38° 5 F. U. S. Nat. Mus. Cat. No. 209112.

This species wants the fimbriate periostracum of *Trichotropis* and the canal is more rounded than in the shallow water species of the genus, but in the absence of soft parts and operculum the shell seems nearer to that group than to any other. The type of sculpture recalls that of some Rissoidae and some species of *Chrysallida.*

Liotia rammata, new species.

Shell depressed-turbinate, of four whorls, the first two and two-thirds whorls and the base of the last whorl white, the upper surface of the last whorl and one-third reddish purple; the suture distinct, not appressed; spiral sculpture on the spire of two prominent threads, the posterior angulating the shoulder, the anterior growing more feeble on the last whorl; the rest of the surface is uniformly covered with fine equal close-set smaller threads slightly roughened by fine incremental lines; the only axial sculpture consists of feeble more or less obsolete plications in front of the suture; base rounded, with a small perforate umbilicus of which the margin is not crenate; aperture circular thickened below. Breadth of shell, 4.7; height, 4.0 mm.

Habitat.—Magdalena Bay, L. Cal., C. R. Orcutt. U. S. Nat. Mus. Cat. No. 217,908.

Liotia olivacea, new species.

Shell of five depressed-turbinate whorls, suture narrow but not appressed, the color very dark olivaceous, the prominent sculpture paler; nucleus minute, decorticated, but apparently smooth; spiral sculpture of on the upper part of the last whorl four strong elevated cords with wider, almost channelled interspaces, the two posterior cords more adjacent;

on the spire only three cords are visible, the anterior more or less undulated; on the base are a single cord, a wide interval, then three more adjacent smaller plain cords, then three close-set beaded cords at the verge of the small perforate umbilicus; aperture circular, upper lip produced on the body, the interior pearly white; breadth of shell, 6.2; height, 5.5 mm.

Habitat.—Taboga Island, Bay of Panama, James Zetek. U. S. Nat. Mus. Cat. No. 331,837.

Another specimen, long in the collection from Panama, but with no collector's name, has all the spiral sculpture strongly beaded, and may be called variety **litharia.** I have no doubt it is an extreme variety of the same species.

Liotia (Arene) cookeana, new species.

Shell small, white, depressed, with a narrow crenulated suture and three rapidly enlarging stellate whorls; axial sculpture of (on the last whorl 13) prominent narrow ribs with wider interspaces, acutely produced at the periphery, and extending nearly to the crenate margin of the funiculate umbilicus; the whole surface in addition is covered with fine close-set sharp almost microscopic axial threads ; beyond the periphery are four or five spiral cords which do not appear on the ribs; aperture circular, the margin crenated by the sculpture. Breadth of shell, 3.0; height, 1.0 mm.

Habitat.—In 7 to 10 fathoms off South Coronado Island, Dr. Fred Baker. U. S. Nat. Mus. Cat. No. 223,290.

This species may attain a larger size but none is known in the California fauna of which it might be the young. It is named in honor of Miss J. M. Cooke of Point Loma, Cal., to whom we are indebted for many interesting shells.

Liotia acuticostata, new var. **radiata.**

Shell resembling the type but with numerous radiating riblets visible in the interspaces between the revolving costae.

Habitat.—Off South Coronado Island in 7 to 10 fathoms, Dr. Fred Baker. U. S. Nat. Mus. Cat. No. 223,291. Also off San Diego in 20 fathoms.

Liotia acuticostata, new var. **stearnsii.**

Resembling *acuticostata* but smaller, with more numerous and less prominent spiral cords. Height, 2.3; width, 2.3 mm.

Habitat.—Gulf of California, Stearns. U. S. Nat. Mus. Cat. No. 47,062.

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PROCEEDINGS

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A REVISION OF THE VIVIPAROUS PERCHES.

BY CARL L. HUBBS.

Viviparity has been developed to a high degree of perfection in certain groups of fishes, among the most notable of which are the Viviparous Perches or Surf-fishes of California. These fishes form a compact group, the family Embiotocidae, which is well differentiated from other Percoid types.

The several genera of the Embiotocidae form three groups, here defined as subfamilies, which differ from one another in the structure of the anal fin, and in dentition. In a general view the most primitive of these three groups appears to be the Embiotocinae. This group contains three-fifths of the genera, and includes the forms of unusual range or habitat, such as the two Japanese genera; those species ranging northward to the Puget Sound fauna; the species descending to moderate depths on the continental shelf (*Zalembius rosaceus*), and the only fresh-water representative of the group (*Hysterocarpus traski*). The other species of Embiotocinae inhabit the bays, beaches, and reefs of the Californian faunal region. The Amphistichinae comprise several surf fishes of California, while the Micrometrinae, a specialized offshoot from the Embiotocinae, include only two species, living almost exclusively along the rocky reefs of California.

Most of the genera of the Embiotocidae are now regarded as monotypic. Such an arrangement of the species doubtless expresses very well their isolated position with reference to one another, but as the expression is one of difference and not of resemblance, it might be urged with justice that the more closely related of the genera should be united. As is frequently the

case in similar situations, this "lumping" of the genera, if undertaken, must be extensive, for they form several more or less uninterrupted series. In the following key an attempt has been made to express the natural arrangement of genera forming these series; to compare directly the types most closely related; and to emphasize the isolated position of the more aberrant species. Detailed descriptions of the genera and species with notes on distribution, etc., are given by Jordan and Evermann (Bull. U. S. Nat. Mus., 47, 2, 1898, pp. 1493–1511), and need not be repeated.

ANALYTICAL KEY TO THE GENERA AND SPECIES OF THE EMBIOTOCIDAE.*

A^1.—Anal fin of the male with the same number of fin-rays as that of the female; no oval depression near its base; front of fin enlarged and fleshy; this fleshy portion modified posteriorly into a hard excrescence, followed by a large and prominent, oval, gland-like structure opening anteriorly, the form of which is subject to some variation in the different genera; anal rays variously crowded or elongate in certain areas, none of them enlarged to form a triangular plate. Teeth of the jaws bluntly conic, uniserial . . . . . *Embiotocinae.*

a^1.—"Spinous dorsal longer than the soft part, of 16 to 18 spines; second anal spine the largest"; scales large; lower pharyngeal flat; "vertebrae 14+20=34"; abdomen short; outline of spinous dorsal rounded; body robust; caudal fin lunate; lower lip without frenum; gill-rakers short . . . . . *Hysterocarpus traski* Gibbons.†

a^2.—Spinous dorsal shorter than the soft part; of 8 to 11 spines; anal spines graduated.

b^1.—Scales rather small, more than 55 in the lateral line.

c^1.—"Dentigerous surface of lower pharyngeals flat or concave"; dorsal soft rays not abruptly higher than the spines.

d^1.—Outline of spinous dorsal rounded; the spines stronger; body robust; the caudal peduncle deep; caudal fin lunate.

e^1.—Abdominal vertebrae 14 or 15; abdomen shorter, the anus being located well before middle of body, excluding the head and the caudal fin; anal fin with a longer base.

f^1.—"Lower lip without a frenum, very thick, lobed or incised behind; gill-rakers long; vertebrae 14+22=36"; snout blunter and more massive, even in the embryo . . . . . *Rhacochilus toxotes* Agassiz.

* These portions of the descriptions in quotation marks are extracted from the key used by Jordan and Evermann (Bull. U. S. Nat. Mus., 47. 2, 1898, pp. 1494–1495). All of the species have been reexamined by the writer, and nearly all of the characters mentioned are confirmed, or used now for the first time.

† The fresh-water species; regarded by Jordan and Evermann, and others, as typical of a distinct subfamily, but its relationships with the Embiotocinae (as here outlined) are very close.

f^2.—"Lower lip thin, normal, entire, with a frenum"; gill-rakers short.

g^1.—Posterior rays of anal in male greatly elevated; teeth less bluntly conic . *Ditrema temminckii* Bleeker.*

g^2.—Posterior rays of anal in male not greatly elevated; teeth blunter and coarser . . . . *Embiotoca.*

h^1.—Caudal vertebrae 18 or 19; first haemal spine a little weaker than the second; anal rays III, 24 to 26; colors variable, of both reddish and greenish types . *Embiotoca* (*Embiotoca*) *Jacksoni* Agassiz.

h^2.—Caudal vertebrae 20 to 22; first haemal spine usually less reduced in size; anal rays III, 28 to 31; colors, reddish with blue streaks *Embiotoca* (*Taeniotoca*) *lateralis* Agassiz.

e^2.—Abdominal vertebrae 17 or 18; abdomen long, the anus being located well behind middle of body, excluding the head and the caudal fin; anal fin with an unusually short, oblique, posteriorly inserted base *Hypsurus caryi* (Agassiz).

d^2.—Outline of the spinous dorsal inclined, the spines being graduated, long and slender; body more slender, the caudal peduncle longer; caudal fin deeply forked.

i^1.—Lower jaw with well developed teeth; gill-rakers very short; lower lip with a frenum; caudal vertebrae 23 or 24; first haemal spine large; colors silvery *Phanerodon furcatus* Girard.†

i^2.—Lower jaw with few or no teeth; gill-rakers long and numerous; lower lip without a frenum *Neoditrema ransonnetii* Steindachner.‡

c^2.—Dentigerous surface of lower pharyngeals convex; soft rays of dorsal abruptly higher than the low spines; first haemal spine applied to the second *Damalichthys argyrosomus* (Girard).

b^2.—"Scales large, 36 to 50 in lateral line; soft dorsal and anal shortish; size small."

j^1.—"Lower lip thin, without frenum; gill-rakers long and slender." . *Cymatogaster aggregatus* Gibbons.

j^2.—"Lower lip thin, with a frenum."

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* *Ditrema laeve* Günther, *Ditrema smitti* Nystrom, and *Ditrema temmincki jordani* Franz, all appear to be synonyms of this Japanese species. Should this genus prove inseparable from *Embiotoca*, then the family name should become Ditremidae.

† A second species, *P. atripes*, is recognized. It is taken in comparatively deep water off the California coast, and is supposed to differ from *P. furcatus* chiefly in color, the pelvics being tipped with blackish, the sides of the body being marked with reddish streaks.

Fin-rays in 25 specimens of *P. furcatus* from San Francisco: D. X or XI, 23 to 25 (rarely 26); A. III, 30 to 33 (rarely 29 or 34).

‡ Japanese; not closely related to *Hypocritichthys*, as is currently stated.

k^1.—"Head slender and pointed; gill-rakers rather slender; body rather elongate, not deeply compressed; dorsal rays, VIII, 15"*
Brachyistius frenatus Gill.

k^2.—"Head rather deep and not pointed; gill-rakers thickish; body deep, compressed; dorsal rays X, 18" . . . *Zalembius rosaceus* Jordan and Gilbert.

A^2.—Anal fin of male containing the same number rays as that of female; no oval depression near its base; front of fin without developed glandular structures; the rays crowded anteriorly before a marked angle in the fin, where a ray (about the twelfth) is modified into a large triangular plate (represented in the female by a ray about twice as wide as the others).† Teeth of jaws bluntly conic, in two series (except in the lower jaw of *Hyperprosopon argenteus*)
Amphistichinae, new subfamily.

a^1.—Lower lip attached to chin by a broad frenum; otherwise quite similar to *Holconotus rhodoterus* . . *Amphistichus argenteus* Agassiz.

a^2.—Lower lip without a frenum.

b^1.—Dorsal spine robust; the outline of the fin evenly rounded; the last spines decidedly shorter than the rays of the soft dorsal; interneurals markedly strengthened, the fourth, supporting the first dorsal spine, with prominent lateral keels or wings; gill-rakers rather thicker and shorter, approaching those of *Amphistichus*, 15 or fewer on lower part of arch
Holconotus rhodoterus Agassiz.

b^2.—Dorsal spines rather slender, abruptly graduated to the long middle spines; the last spine scarcely shorter than the soft rays; anterior interneurals not markedly strengthened, the lateral ridges of the fourth low and rounded; gill-rakers long and slender, 17 to 22 below angle.

c^1.—Lower jaw not so strong, little projecting, so that its teeth are nearly apposed to those of the upper jaw, anal fin longer, of 29 to 37 rays . . . . . *Hyperprosopon.*

d^1.—Teeth strictly biserial in both jaws; eye not so much enlarged as in *H. argenteus*
Hyperprosopon (**Tocichthys**)‡ *agassizii* Gill.

d^2.—Inner series of teeth obsolete on sides of lower jaw; eye larger than in any other species of the family
Hyperprosopon (*Hyperprosopon*) *argenteus* Gibbons.§

c^2.—Lower jaw very strong, projecting forward beyond the upper at the symphysis, so that the teeth of the two jaws are not nearly apposed; anal fin shorter, with about 23 rays
Hypocritichthys analis (A. Agassiz).

* Dorsal VIII or IX, 11 to 13; anal III, 20 to 22 (three specimens examined).

† This is one of those interesting cases in which a secondary sexual character is not confined wholly to its proper sex.

‡ *Tocichthys*, new subgenus (subgenotype, *Hyperprosopon agassizii* Gill). Anal rays in *H. agassizii*, III, 30 to 33 (six specimens).

§ Anal rays in 31 specimens from central California, III, 30 to 35 (37 in one).

A^3.—Anal fin of male containing more rays than that of female;* a large oval depression with a well-defined rim, on body near front of anal fin; the skin thickened in this depression, and the sheaths about cylindrical muscles lying beneath the skin bound to it;† an oval gland-like body with an anterior horn developed on each side of fin, connected with other structures as in the Embiotocinae; anal rays crowded anteriorly, but none modified into a triangular plate. Teeth of the jaws tricuspid, uniserial; intestine longer than in other groups; the two species herbivorous **Micrometrinae,** new subfamily.

a^1.—Scales over oval depression near front of anal fin in male minute; scales also decreased in size in the corresponding area in the female; scales, 43 to 47 (53 in one specimen) along lateral line; difference in the number of soft rays in the anal fin of the two sexes less (18 to 20 in the female; 21 to 23 in the male);‡ dorsal rays VIII (sometimes VII or IX), 17 to 19;‡ the first three spines abruptly graduated, the last five subequal; outlines of body subelliptical **Amphigonopterus** § *aurora* (Jordan and Gilbert).

a^2.—Scales over oval depression near front of anal fin in male rather less reduced in size; scales, 34 to 42 (47 in one specimen); difference in the number of soft rays in the anal fin in the two sexes somewhat greater (13 to 18 in the female; 20 to 23 in the male);‖ dorsal rays IX or X (rarely VIII), 12 to 15;‖ the median spines strengthened and elevated; outlines of body subrhomboidal *Micrometrus*¶ *minimus* (Gibbons).

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* But one other instance of this kind in the whole class of fishes has come to the writer's attention: it is that of the South American Poecilioid genus *Cynolebias* (see Regan, Ann. Mag. Nat. Hist., ser. 8, 10, 1912, pp. 641–642).

† No gland was found beneath this depressson by gross dissection.

‡ About 90 specimens counted.

§ *Amphigonopterus*, new genus; genotype, *Abeona aurora* Jordan and Gilbert, a species inhabiting the rock-pools of the central California coast.

‖ About 90 specimens counted; the variation is extraordinarily wide for a spiny-rayed fish.

¶ Concerning the use of *Micrometrus* Gibbons, in place of *Abeona* Girard, see Jordan (Copeia, No. 49, 1917, p. 86).

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NEW CHINESE FISHES.

BY JOHN TREADWELL NICHOLS.

The American Museum of Natural History has recently accumulated a small collection of fresh-water fishes from China. These have come from two widely separated sources, firstly from Yunnan-fu, Yunnan Province, collected by Mr. John Graham, secondly from Futsing, Fu-kien Province, collected by the Museum's Asiatic Zoological Expedition of 1916–17, about July 25, 1916.

Only one species is common to the two lots, the Goldfish, *Carassius auratus* (Linnaeus).

Owing largely to small collections sent to the British Museum by Mr. Graham over a period of years, the fishes of Yunnan are comparatively well known. It will suffice merely to mention those species in the Yunnan lot already known from that locality: namely (Catfish) *Silurus mento* Regan, *Macrones medianalis* Regan, *Liobagrus nigricauda* Regan; (Carps) *Misgurnus anguillicaudatus* (Cantor), *Nemachilus nigromaculatus* Regan, *Cyprinus carpio* Linn., 2 barbelled form, *Cyprinus micristius* Regan, *Barbus grahami* Regan; (others) *Ophiocephalus argus* Cantor. *Monopterus* sp. (see beyond).

Five species in the Fu-kien lot are well known fishes, namely (Carps) *Acanthogobia maculatus* (Bleeker), *Zacco platypus* (T. & S.), known from Japan, *Opsariichthys bidens* Günther; (others) *Anguilla japonica* T. & S. *Channa ocellata* Peters. Mr. H. R. Caldwell contributes interesting data on *Channa*. This fish is abundant near sea level in the vicinity of Fu-chau, and also occurs, though in less numbers, at Yen-ping. It prefers stagnant water and will travel across country to get from one pool

to another or to invade the rice fields. Natives call it *nguok-la*, "Moon-pike," differentiating it from *chau-la*, "Grass-pike"—*Ophiocephalus*. The reference is to the moon-like markings at the caudal base. It is a good food-fish.

There remain to be considered at greater length two carps from Yunnan (a *Hemiculter* and *Acanthorhodeus*) apparently undescribed; two from Fu-kien, a *Cobitis*, and a fish allied to *Leuciscus* but with peculiar jaw,—and symbranch eels of the genus *Monopterus* from each locality. *Monopterus* from various parts of China is now referred to *M. javanensis* Lacépède, but I find the material from Yunnan and Fu-kien separable, and see no reason why either form should be identical with that in Java, with the description of which neither agrees well.

Cobitis dolichorhynchus, sp. nov.

Resembles the striped loach, *Cobitis taenia*, which ranges from Europe to Japan, but is more elongate, especially the snout. The type and only specimen No. 7026, American Museum of Natural History, was collected at Futsing, Fu-kien Province, China, by the Museum's Asiatic Expedition. It is 66 mm. long to base of caudal. Head 4.0 in this length, depth 5.8. Snout 2.0 in head, pectoral 1.5, ventral 1.7, longest dorsal ray 2.0, longest anal ray 1.9, caudal 1.5, depth of peduncle 2.0. Eye 3 in snout. Interorbital 1.5 in eye.

A strong, unequally forked spine recumbent in an elongate pit which extends forward from below the front of the eye. Body compressed, head and snout strongly compressed. Interorbital flat. Mouth small, well under the projecting snout, the gape reaching to below a point midway between tip of snout and nostril. A pair of barbels near the tip of snout, another at the end of the maxillaries, and a third in an intermediate position. Besides these six, a short barbel at the nostril. A broad, fleshy, weakly three-lobed membrane under the chin. Dorsal origin equidistant from chin and caudal base. Ventral slightly in advance of middle of dorsal. Pectoral reaching slightly more than half way to ventral, ventral slightly more than half way to anal, anal not reaching caudal by a distance equal to a third of head. Caudal rounded. Body covered with very small scales. Dorsal 9. Anal 7.

Color in spirits pale, darker on top of head, a dark streak from eye to snout, dark specks on the cheek. Irregular dark cross blotches occupying most of the back. Below these a narrow dark stripe extends backward from the nape, broken and mixed with the dorsal blotches behind the dorsal fin. A row of more or less oval dark blotches from the center of the side behind the gill cover to the lower caudal base, a faint dusky shade connecting them. Between the blotches and the stripe above, a ragged dark streak extends backward, terminating in widely spaced

specks under the dorsal. A narrow oblique vertical inky-black blotch at the upper base of the caudal. Dorsal and caudal with dark bars.

Georgichthys, gen. nov.

Type, Georgichthys scaphignathus, sp. nov.

A cyprinid fish with superficial resemblance to certain species of *Leuciscus.* Mouth small, slightly inferior. Rami parallel and fused, the lower jaw rather broad and rounded at its end, flat above, covered in front and above with a longitudinally fluted membrane. Lips rather thick, confined to the sides of the lower jaw. No barbels. Scales moderate. Lateral line complete, in the center of the peduncle. Dorsal without spinous ray, its origin slightly in advance of ventral. Dorsal and anal fins short. Teeth in a single row, five, hooked. This interesting minnow is named for George Borup Andrews.

Georgichthys scaphignathus, sp. nov.

The type and only specimen, No. 7038, American Museum of Natural History, collected at Futsing, Fu-kien Province, by the Museum's Asiatic Expedition, is 70 mm. long to base of caudal. Head 4.0 in this measure, depth 3.5. Snout 3.3 in head, eye 4.0, interorbital 3.1, maxillary 4.0, not reaching eye, pectoral 1.3, ventral 1.4, longest dorsal ray 1.3, longest anal ray 1.5, caudal 1.0.

Body moderately compressed, peduncle 1.4 times as long as broad. Ventral not reaching anal, anal not reaching caudal, which is moderately forked. Scales normal on the rounded belly and elsewhere, with conspicuous radiating and concentric marking, 39, 4½ between lateral line and dorsal, 3 between lateral line and ventral. Dorsal 9. Anal 8.

Color in spirits dark on the back, the sides with extensive irregular dark blotches, front of dorsal and center of caudal lobes blackish, under surface of body, and fins otherwise pale. (*scaphignathus*—spade-jaw.)

Hemiculter andrewsi, sp. nov.

Scales smaller than in others of the genus (see monograph by Warpachowski. Bull. Ak. Sci. St. Petersb. 32, 1888, pp. 15 to 23, and Nikolski Annre. Mus. St. Petersb. 8, 1903, p. 359, for an additional species.) Teeth in 3 rows, compressed, and slightly hooked, 4–4–2.

The type, No. 7038, American Museum of Natural History, was collected at Yunnan-fu, Yunnan, China, by Mr. John Graham. It is 137 mm. long to base of caudal. Head 3.8 in this length, depth 4.2. Eye 4.2 in head, snout 4.0, interorbital 3.5, maxillary 3.4, depth of peduncle 2.8, pectoral 1.5, ventral 2.0, longest dorsal ray 1.9, longest anal ray 2.9, caudal 1.4.

Elongate, moderately compressed, peduncle twice as long as deep. Mouth moderate, rather oblique, lower jaw distinctly projecting, maxillary not quite to under front of eye, no barbels. Gill-rakers numerous and slender (the longest ½ eye), about 45 on the first arch, backed by a

second row of shorter ones. Dorsal without a spine, its second ray soft and segmented though not divided, its origin a little behind ventral base, equidistant from base of caudal and front of eye. Pectoral pointed, reaching ⅔ to ventral, ventral a little more than half way to anal, anal not reaching caudal by a distance equal to half head, caudal deeply forked. Apparently a low keel on belly behind ventrals and none in front of them (all three specimens are so cut as to make this difficult of determination). Lateral line complete, dropping to the lower part of the side with an abrupt flexure over end of pectoral, rising gradually on the peduncle to terminate in the center of same. Scales of moderate size on the body becoming smaller posteriorly, about 75, 11 between lateral line and dorsal, 3 between lateral line and ventrals. Dorsal 9. Anal 15.

Brownish along the back, silvery elsewhere. Named for Mr. and Mrs. Roy Chapman Andrews in recognition of their recent zoological explorations in Yunnan. Besides the type we have two smaller specimens of 114 and 116 mm. with the same data. The type is a female with eggs.

Acanthorhodeus grahami, sp. nov.

Close to *Acanthorhodeus atranalis* Günther, but more slender. Depth 3.0 to 3.3 (instead of 2.5); 4½ scales between lateral line and vent (instead of 5½). Dorsal soft rays 11 to 13, anal 10 to 11. Scales 37 to 39. Teeth in one row, 5, slender, hooked, denticulate.

The type, No. 7029, American Museum of Natural History, was collected at Yunnan-fu, Yunnan, China, by Mr. John Graham. It is 54 mm. long to base of caudal. Head 4.0 in this length, depth 3.1. Eye 2.7 in head, snout 4.1, interorbital 3.4, maxillary 3.5, depth of peduncle 2.5, dorsal spine 1.6, longest ray 1.4, anal spine 1.7, longest ray 1.6, pectoral 1.3, ventral 1.5, caudal about 1.0.

Body compressed. Mouth oblique, lower jaw slightly projecting, maxillary not quite reaching front of eye, upper jaw strongly protractile, angle of mandible under front of eye, no barbels. Upper profile straight to nape, thence convex to dorsal, thence concave to caudal; lower profile oblique to angle of mandible, thence horizontal to gill opening, thence gently convex to anal, thence slightly concave to caudal; peduncle tapering, 2⅓ times as long as deep. Vent just behind base of ventrals with a conspicuous papilla. Pectoral narrow and pointed, just reaching ventral, ventral just not reaching anal, dorsal and anal slightly concave above, caudal forked. Dorsal origin behind ventrals, midway between snout and base of caudal; anal origin under middle of dorsal. Second dorsal and anal rays developed as strong sharp spines, but not serrate. Scales loosely attached, lateral line complete, below the center of the front of the peduncle. Scales 38, 4½ between lateral line and vent, 6½ between it and dorsal. Dorsal II 12. Anal II 10.

Color pale. Sides silvery, the silvery forming an ill-defined stripe posteriorly, with a faint dark central streak. Most of the anal occupied by a large black semi-oval terminal blotch, which does not extend on the spines or posterior rays.

Besides the type, a male, we have 4 males and 3 females of about the same size with the same data. Females lack the black anal blotch, have the ventral papilla more prominent, and a long vermiform oviduct.

Monopterus cinereus Richardson.

Ichthyology Voyage of the *Sulphur*, 1844, p. 117, plate 52. Woosung. Not *Pneumabranchus cinereus* McClelland. See Richardson, Ichthyology of China. Rept. Brit. Assoc. Adv. Sci. 1845 (1846), p. 315.

Measurements of Yunnan specimens are as follows:

Total length.	Head in length.	Tail from vent in length.	Eye in snout.
420 mm.	12.4	3.7	2.0
338	12.1	3.6	1.7
336	12.0	3.6	1.5

The two smaller specimens (and a third with imperfect tail of about the same size) agree with Richardson's excellent figure in Voyage of the *Sulphur*. The larger specimen is pale colored with occasional blackish blotches. They lack evident fins.

Monopterus xanthognathus Richardson.

Voyage of the *Sulphur*, 1844, p. 118, plate 52. Canton.

Measurements of Fu-kien specimens are as follows:

Total length.	Head in length.	Tail from vent in length.	Eye in snout.
284 mm.	13.5	4.2	2.3
173	13.8	3.6	2.0

These specimens differ from *cinereus* just as does Reeves' figure on which Richardson bases his description, in a shorter tail, smaller eye, and a high gibbous nape.

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PROCEEDINGS
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FIVE NEW MAMMALS FROM ARIZONA AND COLORADO.

BY E. A. GOLDMAN.

Study of recent collections of mammals from various western States reveals the existence of five hitherto unrecognized geographic races. At least two of these present color characters which indicate strong reaction to environmental conditions.

The new forms are characterized as follows:

Sigmodon hispidus confinis, subsp. nov.
GILA COTTON RAT.

Type from Safford, Arizona (altitude 2,900 feet). No. 204241, ♂ adult (molars rather slightly worn), U. S. National Museum (Biological Survey Collection), collected by J. L. Peters, July 27, 1914. Original number 77.

Geographic distribution.—Upper part of the Gila River Valley in southeastern Arizona.

General characters.—A rather small subspecies similar in general to *Sigmodon hispidus berlandieri*, *Sigmodon h. arizonae*, and *Sigmodon h. eremicus*, but darker than any of these forms, with skull narrower, less massive and differing in important details.

Color.—Upperparts near pinkish-buff (Ridgway, 1912) heavily mixed or lined with blackish over top of head and back, the latter element thinning out along cheeks, shoulders and sides; underparts and feet dull whitish or grayish; ears usually grayish, but varying to buffy inside; tail brownish above, grayish below.

Skull.—Similar to those of *S. h. berlandieri*, *S. h. arizonae*, and *S. h. eremicus*, but narrower and less massive than any of them; rostrum narrower; much smaller than that of *S. h. arizonae*, with frontals less acutely prolonged posteriorly, and interparietal and audital bullae relatively smaller; interparietal and audital bullae small, much as in *S. h. eremicus*, but dentition lighter.

Measurements.—Type; Total length, 277; tail vertebrae, 111; hind foot, 31. *Skull:* Greatest length, 34.3; zygomatic breadth, 19.2; interorbital breadth, 4.8; nasals, 13.2; width of braincase (in front of descending process of supraoccipital), 13.2; maxillary toothrow, 6.

Remarks.—*Sigmodon hispidus confinus* appears to be a well-marked form restricted in distribution to the upper part of the Gila River Valley. Its general characters indicate as close relationship to *S. h. berlandieri* of the Rio Grande Valley as to its geographic neighbors in Arizona. In size it departs most widely from *S. h. arizonae*, which is a much larger animal confined to the upper part of the Verde River Valley.

Specimens examined.—Fourteen, all from the type locality.

Sigmodon hispidus jacksoni, subsp. nov.

JACKSON'S COTTON RAT.

Type from 3 miles north of Fort Whipple (near Prescott), Arizona (altitude 5,000 feet). No. 214121, ♂ subadult (third upper molar slightly worn), U. S. National Museum (Biological Survey Collection), collected by H. H. T. Jackson, July 8, 1916. Original number 456.

Geographic distribution.—Known only from the plateau region near Prescott, Arizona.

General characters.—A pallid form, similar to *Sigmodon hispidus eremicus* in general color, but upperparts more uniform, the sides not so distinctly lighter than back as in that subspecies; skull differing in detail, especially the greater breadth of braincase. Contrasting with *Sigmodon hispidus arizonae* in smaller size, paler color and cranial features.

Color.—Type: Upperparts near light ochraceous-buff (Ridgway, 1912), finely and nearly uniformly mixed or lined with dusky, the sides scarcely paler than back; underparts and feet dull whitish or grayish; ears pale buffy inside; tail brownish above, grayish below.

Skull.—Closely resembling that of *S. h. eremicus*, but braincase broader; audital bullae more inflated; interparietal small, much as in *eremicus*. Compared with that of *S. h. arizonae* the skull is smaller; frontal region shorter, and lacking the narrow posterior prolongation on median line between parietals present in *arizonae;* interparietal and audital bullae relatively smaller.

Measurements.—*Type:* Total length, 249; tail vertebrae, 108; hind foot, 33. *Skull:* Greatest length, 31.2; zygomatic breadth, 18.2; interorbital breadth, 5; nasals, 11.4; width of braincase (in front of descending process of supraoccipital), 13.5; maxillary toothrow, 6.4.

Remarks.—This subspecies is based on a single immature specimen which differs so markedly from the considerable series of comparable examples now available of neighboring forms as to warrant recognition. The type locality is only a few miles from that of *S. h. arizonae*, but at a higher elevation and in a different life zone.

Specimens examined.—One, the type.

Perognathus intermedius phasma, subsp. nov.

GILA POCKET MOUSE.

Type from Tinajas Altas, Gila Mountains, Yuma County, Arizona (altitude 1,400 feet). No. 203003, ♀ adult, U. S. National Museum (Biologi-

cal Survey Collection); collected by E. A. Goldman, November 23, 1913. Original number 22309.

Geographic distribution.—Desert mountains of extreme southwestern Arizona, and doubtless adjacent parts of Sonora, Mexico.

General characters.—Similar in general to *Perognathus intermedius intermedius*, but smaller and decidedly paler, the upperparts a lighter buff less densely mixed with black.

Color.—Type: Upperparts between light buff and pale ochraceous-buff (Ridgway, 1912), purest on cheeks, sides, and across hips, the top of head and back modified by rather thinly overlying dusky-tipped hairs; underparts, limbs, and feet white; tail brownish above, white below, except penciled tip which is brownish all around.

Skull.—Like that of *P. i. intermedius*, but smaller.

Measurements.—Type: Total length, 165; tail vertebrae, 97; hind foot, 20.5. *Skull* (type): Greatest length, 23; greatest mastoid breadth, 12.3; interorbital breadth, 5.8; nasals, 8.5; interparietal, 6.1 x 2.6; maxillary toothrow, 3.4.

Remarks.—The discovery of this geographic race materially extends the known range of *Perognathus intermedius* in southwestern Arizona. The pallid coloration of the new form, paralleled by that of a congenor, *Perognathus pencillatus angustirostris*, inhabiting the same region, is apparently associated with light-colored soil conditions. Some of the other small mammals living in the restricted area appear to have yielded to similar environmental influences.

Specimens examined.—Three, all from southwestern Arizona, as follows: Tinajas Altas (type locality), 2; Tule Wells, 1.

Perognathus apache cleomophila,* subsp. nov.

PLATEAU POCKET MOUSE.

Type from Winona, Coconino County, Arizona (altitude 6,400 feet). No. 226344, ♂ adult, U. S. National Museum (Biological Survey Collection). Collected by E. A. Goldman, July 19, 1917. Original number 28127.

Geographic distribution.—Lava beds region east of San Francisco Mountain, Arizona.

General characters.—Closely allied to *Perognathus apache apache*, but upperparts much darker and richer in general coloration, the ochraceous buffy element deeper or more intense, and more heavily overlaid with black. Similar to *P. a. melanotis*, but larger and darker, with skull differing in detail.

Color.—Type: Upperparts near ochraceous-buff (Ridgway, 1912) but slightly more tawny, this color pure along broad lateral line, but much obscured on head and back by overlying black-tipped hairs; underparts, fore limbs, and feet white; ears blackish inside; subauricular white spots conspicuous; tail brownish above, white below. In some specimens an

* From *Cleome serrulata*, the seeds of which are extensively gathered by this pocket mouse.

ochraceous buffy line extends along the outer side of the forearm; in others, including the type, the entire forelimbs are white.

Skull.—About like that of *P. a. apache*. Similar to that of *P. a. melanotis*, but larger; mastoids and audital bullae decidedly larger; interparietal relatively narrower.

Measurements.—*Type :* Total length, 138; tail vertebrae, 65; hind foot, 20.5. Average of five adult topotypes: 138 (134-143); 65 (63-69); 20.5 (19.5-21). *Skull* (type): Greatest length, 23.2; greatest mastoid breadth, 12.8; interorbital breadth, 5.2; nasals, 8.3; interparietal, 3.9 x 3.1; maxillary toothrow, 3.3.

Remarks.—While *Perognathus apache cleomophila* resembles *P. a. melanotis* in color, the skull indicates closer relationship to the pallid form, *P. a. apache*, of the Painted Desert region. The dark coloration of the upperparts harmonizes well with that of the decomposed lava or cinders of its local habitat and contrasts correspondingly with that of *P. a. apache* and the lighter sands it inhabits.

Specimens examined.—Twenty-six, all from the vicinity of the type locality.

Perognathus apache caryi, subsp. nov.

COLORADO POCKET MOUSE.

Type from 8 miles west of Rifle, Galfield County, Colorado. No. 148206, ♂ adult, U. S. National Museum (Biological Survey Collection), collected by Merritt Cary, October 4, 1906. Original number 937.

Geographic distribution.—Valleys of Grand River and other affluents of the Colorado River in western and southwestern Colorado.

General characters.—Most closely allied to *Perognathus apache apache*, but larger and darker; skull more massive and differing in other details. Closely resembling *P. a. melanotis* in color, but decidedly larger and in cranial characters departing farther than from *P. a. apache*.

Color.—*Type :* Ground color of upperparts near light ochraceous-buff (Ridgway, 1912), pure along broad, conspicuous lateral line from cheeks to hips, the middle of face, top of head and back rather heavily lined with black; underparts, forelimbs and feet white; ears blackish inside; subauricular white spots distinct as in other forms of the group ; tail light brownish or grayish above, white below. A specimen from Coventry is rich ochraceous-buff, this color partially suffusing the underparts.

Skull.—Similar to that of *P. a. apache*, but larger and more massive, the braincase higher, more arched; nasals longer; ascending branches of premaxillae broader; interparietal slightly larger, more extended anteroposteriorly; mastoid and audital bullae about the same. Contrasted with that of *P. a. melanotis* the skull appears still larger, with larger mastoid and audital bullae and differs otherwise in the same characters as from *P. a. apache*.

Measurements.—Type: Total length, 154; tail vertebrae, 73; hind foot, 21. An adult topotype, 145; 73; 19.5. *Skull* (type): Greatest length,

25.2; greatest mastoid breadth, 13.5; interorbital breadth, 5.6; nasals, 9.3 x 3.4; maxillary toothrow, 3.4.

Remarks.—Specimens of *Perognathus apache* from Colorado were provisionally referred by Cary* to the typical form, but reexamination of certain of them in connection with additional material from other regions reveals the rather well-marked differential characters here pointed out. Examples from Medano Springs ranch, 15 miles northeast of Mosca in the upper Rio Grande Valley in southern Colorada, also referred to *P. a. apache* by Cary, seem more properly assignable to *P. a. melanotis.*

Specimens examined.—Four, all from Colorado, as follows:

Rifle (8 miles west), 3; Coventry, 1.

* North Amer. Fauna, No. 33, p. 147, August 17, 1911.

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PROCEEDINGS

OF THE

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A NEW GENUS AND THREE NEW SPECIES OF NORTH AMERICAN MEMBRACIDAE (HEMIPTERA).

BY E. D. BALL.

The division of the Telamonini into genera based upon the position and shape of the dorsal crest or "horn" has been criticised in some quarters as having been based on trivial and variable characters. Especial emphasis has been laid on the fact that the pronotum is very variable and has undergone striking modifications in the adaptation of the different species. This may be true and probably is, but these apparent trivial characters seem to be correlated with other less obvious structural characters and with larval variations which indicate that the grouping brought about is in line with the evolution of the group. As natural grouping is the end sought in generic arrangement, the characters involved must be considered adequate.

A study was undertaken primarily to determine the position of a large and striking species taken by the writer in the foothills back of Pasadena, California. The species, as well as the genus, proves to be new and has been described below along with two other western treehoppers new to science.

Telonaca, n. gen.

Intermediate in structure between *Telamona* and *Glossonotus* with a slight sinuation or "step" on the posterior face of the crest in some individuals suggesting *Heliria*.

Species large, pronotum long, acuminate. Crest very variable, located behind the humeri, inclined to be acuminate but not foliaceous, usually higher than its basal width, slightly irregular in outline. Some individuals show a definite sinuation or even a sharply defined "step" on the posterior face suggesting *Heliria*. Head broad and very short. Humeral

angles much shorter than in most species of *Heliria*, about equalling *Telamona*.

Type of the genus *T. ramona*, n. sp.

Telamona pyramidata Uhl. and its allies are probably the most typical representatives of this group but as the specific limits in that complex are still uncertain it was thought best to locate the generic type elsewhere.

Telonaca ramona, n. sp.

Resembling *Telamona viridia* in size and general appearance but with a much higher crest. Crest nearly as high but much wider than in *alta*. Green with a large acute or broader and slightly notched crest. Length ♀ 10–11 mm.; ♂ 9–10 mm.

Head broad and very short, the lower margin scarcely more arcuated than the upper. Humeral angles short and broad, scarcely longer than in *viridia*, shorter than in *pyramidata*. Crest quite high, twice the height of *viridia*, broader but nearly as high as in *alta*, roundingly acuminate or with a slightly notched posterior outline. The crest is quite variable in basal width. only the wider examples showing the notch or slight step. Apex of the pronotum scarcely equaling the tegmina.

Color: green, tinged with brown in some of the punctures and along the carina especially over the crest. A definite black spot above either eye.

Described from a pair taken by the writer at Pasadena, California, July 31, and a pair of paratypes from Ontario, California, July 25, taken by Professor Hine. Types in the author's collection.

Heliria rubidella, n. sp.

Resembling *scalaris*, slightly smaller, paler and with a much smaller and less notched crest. Length ♀ 9 mm.; ♂ 8 mm.

Head broad and short. Humeral angles blunt, broader at base than their length, shorter than in *scalaris*. Crest about one-half the size of that in *scalaris* both in height and length, slightly narrowing above with the anterior half slightly roundingly raised above the level of the posterior half. The dorsal margin thus formed being sinuate and slightly sloping posteriorly to the obtuse posterior angle. Tegmina exceeding the pronotum.

Color: rich brown, mottled or washed with pale creamy on the metapodium excepting the humeral angles. A submarginal line and the carina on metapodium black with irregular white interruptions. A lunate white area on posterior face of crest set off by an irregular black margin and interrupted black markings on carina. An irregular widening of the light area extends to the lateral margin well behind the crest. An oblique, dark margined, light area opposite posterior base of crest. Tegmina with a large smoky cloud at apex covering twice the width of the apical cell.

Described from a pair taken by the writer at Fort Collins, Colorado, July 8, two paratypes from the same place and date and two taken June

28. Types in the author's collection. This species on account of the rich brown color was thought to be a western variety of *scalaris* until a larger series of that species was studied. It appears to be quite constant in the much smaller and sinuated rather than definitely stepped crest and the color pattern is quite distinctive.

Platycentrus taurinus, n. sp.

Shorter and stouter than *acuticornis* with much shorter horns. Resembling *obtusicornis*, but with horns more slender and tapering. Length ♀ 6.5 mm.; width of horns 5.5 mm.

Head broader and less arcuated at base than in *obtusicornis*, metapodium convex, coarsely punctured, rugulose. A pair of large depressed, finely shagreened callosities situated on a line with the horns and the ocelli and two pairs of smaller irregular ones outside these. A pair of horns arising directly above the humeri and extending obliquely forward and upward forming a right angle with the margin of the pronotum and curving outward and slightly backward until their acute apices extend horizontally. Viewed from above the extreme curve of the horns exceeds the metapodium. Viewed from in front they rise but little above the level of the dorsum. The horns are thick at the base, triquetrous or almost quadrangular, regularly narrowing to the acuminate apices. Anterior and posterior carinae sharp and definite, usually a carina arising from above the humeri and extending to the apex and an irregular dorsal one much broken at the base. Posterior process of pronotum broad at base then slightly inflated and rapidly roundingly narrowing to an acute apex.

Color: dark brown punctured with fuscous, which is emphasized on the face, base of horns and posterior process. Carinae and coarse rugae lighter especially behind the horns and before the process. Callosities black. Tegmina hyaline, nervures distinct, brown, growing paler toward the margins; basal area fuscous adjoined by a light band which interrupts the brown on the nervures.

Described from a female taken by the writer from Cabazon, California, June 20, and five paratype females from the same place. Types in the author's collection.

This is probably the species listed by VanDuzee as *acuticornis* Stal but is quite distinct from examples of that species in the writer's collection from Mexico. It is much nearer *obtusicornis* but differs from that species in the shape and position of the horns.

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A NEW SUBSPECIES OF CHIPMUNK FROM THE YELLOWSTONE NATIONAL PARK.

BY VERNON BAILEY.

In the list of mammals of the Yellowstone Park in the 1917 Circular of Information,* I referred the little gray sagebrush chipmunk of the open valley about Swan Lake to *Eutamias minimus pictus* (Allen), basing my provisional identification on the animals seen alive and running through the sagebrush. On visiting the park again in September, 1917, I explained to Mr. Chester A. Lindsey, Acting Supervisor of the Park, the necessity of obtaining a few specimens of these chipmunks for identification and was granted a permit for taking such as were needed. On making a critical comparison of these specimens with others in the National Museum Collection I find that while they closely resemble the little gray *pictus* of the Great Basin country they are in reality a pale gray form of *E. consobrinus* which occupies the higher country of the Park and mountain ranges to the southward, and that they can not be referred to any form at present recognized. They may be known by the following description:

Eutamias consobrinus clarus, subsp. nov.

Type from Swan Lake Valley, Yellowstone National Park; adult ♂, No. 227313, U. S. National Museum, Biological Survey Collection. Collected by Vernon Bailey, September 13, 1917; original number 9945.

Characters.—A small slender chipmunk, paler and grayer than *consobrinus*, but with the same fulvous under surface of tail. Size of *consobrinus*, but colors paler and clearer gray with much less fulvous on sides and upperparts. Under surface of tail rich fulvous, almost as dark as in

*General Information regarding Yellowstone National Park, Department of the Interior, Season of 1917. Mammals by Vernon Bailey, pp. 44–54.

typical *consobrinus* and strikingly different from the buffy and gray under surface of tails of *minimus* and *pictus;* median dorsal stripe clear black and reaching from crown to base of tail; two pairs of lateral dark stripes brownish black; two outer light stripes white or whitish; two inner light stripes clear gray; throat white; belly buffy.

Measurements.—Type specimen: Total length, 190; tail vertebrae, 85; hind foot, 31; an adult ♂ from Snow Pass, only two miles from type locality, 198; 88; 32. *Skull.*—Basal length, 25; zygomatic breadth, 16; mastoid breadth, 15; nasals, 8; alveolar length of upper molar series, 4.5.

Remarks.—This is merely a pale valley form of *E. consobrinus* which superficially resembles *pictus*, and has no connection with the larger, yellow *pallidus* lower down the Yellowstone Valley in Montana.

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A NEW BULLFINCH FROM CHINA.

BY J. H. RILEY.*

Mr. George D. Wilder, of Peking, China, has presented to the U. S. National Museum a small bullfinch captured in the wooded mountains of Chili Province, China. It apparently represents an isolated race of *Pyrrhula erythaca*, which I take pleasure in naming after the donor:

Pyrrhula erythaca wilderi, subsp. nov.

Type, adult female, U. S. National Museum, No. 254,074, Eastern Hills about sixty miles east of Peking, China, February, 1917. Collected by George D. Wilder (original No. 419).

Similar to *Pyrrhula erythaca* Blyth, but smaller, with black facial mask more restricted, the lighter border of the facial mask almost obsolete, the lighter tips to the greater coverts narrower, and the dark band across the lower back less pronounced and lighter in color.

Description.—A narrow band surrounding the bill and running back around the eye and slightly further as a postocular streak, black; a narrow band bordering the black on the forehead and below the eye, smoke gray; top of head, cervix, sides of neck, auriculars, and upper back, neutral gray; back and scapulars, wood brown; a band across the lower back, deep neutral gray; rump, white; upper tail coverts, tail, and primaries, black with steely blue reflections; alula, lesser, middle, and primary wing-coverts, deep neutral gray; greater wing-coverts, black, tipped rather broadly with drab and the outer feathers narrowly edged at the tip with white, forming a wing-bar; chest drab; flanks cinnamon-drab; middle of belly, under tail-coverts, and under wing-coverts, white. Wing, 73.5 (85); tail, 53 (65.5); culmen, 8.5 (10.5) mm.

Remarks.—I have given the measurements of a female specimen of *Pyrrhula e. erythaca* from Szechuan Province in parenthesis for comparison.

* Published with the permission of the Secretary of the Smithsonian Institution.

Pyrrhula erythaca Blyth* was described from the Himalayas of Sikhim, whence it ranges into western Szechuan and Kansu Provinces, China. The race above described seems to be widely separated, geographically, from the remainder of the species and additional material may prove it to be worthy of specific rank.

Mr. Wilder has sent the following note on the habitat of this new form: "It is a fine wooded hill country of some four thousand square miles, the only good forest country in this province and it is being rapidly cut and burned. This forest is about sixty miles east of Peking, in mountains that are clothed with pine at the tops and with thin growths of oak, elm, wild pear, etc., on the lower hills. The hunter [who brought this specimen] reported that the birds come every winter but he has brought none this year."

* Ibis, 1862, 389.

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PROCEEDINGS

OF THE

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A NEW HARE FROM BRITISH EAST AFRICA.

BY N. HOLLISTER.

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A study of the African hares in the collection of the United States National Museum has shown the necessity for recognizing the following new subspecies:

Lepus capensis abbotti, subsp. nov.

Type from plains east of Mount Kilimanjaro, British East Africa; ♀ adult, skin and skull. U. S. National Museum, No. $\frac{190144}{3477}$. Collected September 20, 1888, by Dr. W. L. Abbott.

Characters.—One of the chain of subspecies of *Lepus capensis*, most resembling typical *capensis* and *Lepus capensis crawshayi*. Differs from *L. c. capensis* in generally richer coloration and in the deeper ochraceous sides, limbs, and nape; ears browner, less gray. From its nearest geographical neighbor, *L. c. crawshayi*, which, when in fresh pelage, is also rather a richly colored form, it is distinguished by the more ochraceous tone of the buffy hair rings above; more ochraceous, less blackish, shoulders and sides of neck; deeper ochraceous nape-patch, throat-patch, sides, and limbs; and browner ears. The ears average slightly shorter than in *crawshayi*. Skull as in *crawshayi* but with rostrum and nasal bones longer. A young example in juvenile coat is decidedly darker (more brownish, less gray) than the young of *crawshayi* in corresponding pelage, with much deeper colored nape and throat.

Measurements of type specimen.—Ear from notch, dry, 82 millimeters. Skull: Occipitonasal length, 87.5; condylobasal length, 76.9; zygomatic breadth, 40.5; interorbital constriction, 15.9; postorbital constriction, 10.3. breadth of braincase, 28.7; diagonal length of nasals, 38.8; greatest breadth of nasals, 19.7; maxillary tooth row, 15.3; mandibular tooth row, 16.1.

Remarks.—The resemblance of the hare from the Kilimanjaro plains to *Lepus capensis capensis* of South Africa has been noted by various

authors.* Later† the animal was referred to *Lepus crawshayi* de Winton, originally described from Kitwyi, central British East Africa. Specimens of East African hares are so rarely in good fresh pelage that without large series of skins satisfactory comparisons are difficult to make. Out of twenty-five skins of *Lepus capensis crawshayi* in the National Museum collection only two or three specimens are in fresh pelage like the type and one adult topotype of *L. c. abbotti*, but comparison of these specimens leaves no doubt as to the subspecific distinction of the Kilimanjaro hare. The young example referred to *abbotti* comes from Maji-ya-chumvi, between the Taita Hills and the coast. It is interesting that the Kilimanjaro hare resembles in color the Cape form so much more than it does the intermediate subspecies.

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* True, Proc. U. S. Nat. Mus., vol. 15, p. 468, 1892; Thomas, Ann. and Mag. Nat. Hist. ser. 6, vol. 12, p. 269, 1893.

† Thomas, Ann. and Mag. Nat. Hist., ser. 8, vol. 6, p. 316, 1910.

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A NEW UNSTALKED CRINOID FROM THE PHILIPPINE ISLANDS.

BY AUSTIN H. CLARK.

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In the course of her investigations among the Philippine Islands the *Albatross* dredged an interesting new species of the genus *Prometra*, which may be known as

Prometra longipinna, new species.

The cirri have 14–15 segments of which the fourth and following are about as long as broad; the cirrus length is about 4 mm.

The arms are about 30 mm. long, resembling those of *P. owstoni*.

P_1 is 5 mm. long, stiff and spine-like, composed of 11–12 segments of which the first is broader than long, the second one-third again as long as broad, and the fourth and following two and one-half to three times as long as broad; the terminal three or four have prominently spinous distal ends. P_2 is 5 mm. long with 11–12 segments, exactly resembling P_1. P_3 is 5 mm. long with 11 segments of which the outer are slightly more elongate than those of the preceding pinnules, and the fourth and following have everted and spinous distal ends. P_4 and the following pinnules are 3.5 mm. long with 10 segments, smaller and weaker than the preceding pinnules, though the component segments are of about the same proportions; the fourth and following have everted and spinous distal ends. The distal pinnules are 4.5 mm. long with 14 segments of which the third and following have slightly produced and finely spinous distal ends.

Type.—Cat. No. 35366 U. S. N. M., from *Albatross* Station 5356, North Balabac Strait, Philippine Islands, in 58 fathoms.

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THREE NEW BATS FROM HAITI AND SANTO DOMINGO.

BY GERRIT S. MILLER, Jr.

Owl-pellets collected by Dr. W. L. Abbott in a small cave near Port de Paix, Haiti, contain the remains of five species of bats: *Erophylla santacristobalensis* (Elliot), *Phyllops haitiensis* (J. A. Allen), *Artibeus jamaicensis jamaicensis* (Gosse), and a *Brachyphylla* and *Eptesicus* representing new local forms. Dr. Abbott also took a specimen of the *Eptesicus* at Constanza, Santo Domingo. Near Jérémie, Haiti, he secured a new local form of *Monophyllus*.

Brachyphylla pumila, sp. nov.

Type.—Skull (lacking roof of braincase and all the teeth except pm^4 and m^1) No. 218354 U. S. National Museum. Collected in a small cave ("Trou de Bon Dieu") near Port de Paix, Haiti, by Dr. W. L. Abbott.

Characters.—Like the Cuban *Brachyphilla nana*, but first upper molar with inner portion of crown narrower, the protocone rising abruptly from posterior margin to summit, its base noticeably wider in proportion length than in any other known member of the genus.

Measurements.—Condylobasal length, 25.2 (24.2)*; zygomatic breadth, 14.8 (14.4); interorbital constriction, 6.3 (6.7); lachrymal breadth, 8.6 (—); breadth of braincase, 11.6 (11.7); depth of braincase at middle, (9.0); maxillary toothrow (exclusive of incisors), 9.2 (8.9).

Specimens examined.—Two, both from the type locality.

Remarks.—The *Brachyphilla* of Haiti is very different from the large *B. cavernarum* of Porto Rico. It is nearly related to the Cuban representative of the genus, but the characters of the first molar indicate its specific distinctness.

Eptesicus hispaniolæ, sp. nov.

Type.—Adult male (in alcohol), No. 217207 U. S. National Museum. Collected at Constanza, Santo Domingo, September 22, 1916, by Dr. W. L. Abbott.

* Measurements in parenthesis are those of a second specimen from the type locality.

Characters.—A small species, like the other West Indian forms. Skull about the same size as in *Eptesicus cubanus* (smaller than in *E. wetmorei*, larger than in *E. bahamensis*), its general outline broader than in any of the related insular species. Color dark, essentially as in *E. cubanus*.

Measurements.—Head and body, 61; tail, 40.4; tibia, 18.0; foot, 10.5; forearm, 44.7; thumb, 7.4; third finger, 75; fourth finger, 67; fifth finger, 58; ear from meatus, 14.2; ear from crown, 12.6; width of ear, 11.5; condylobasal length of skull (teeth moderately worn), 16.4; zygomatic breadth, 11.7; interorbital constriction, 4.2; lachrymal breadth, 6.4; breadth of braincase, 8.0; depth of braincase at middle, 5.4; mandible, 12.3; maxillary toothrow (exclusive of incisors), 6.2; mandibular toothrow (exclusive of incisors), 7.0.

Specimens examined.—The type, from Constanza, Santo Domingo, and two imperfect skulls from Port de Paix, Haiti.

Remarks.—The *Eptesicus* of Haiti and Santo Domingo is a well characterized form. Its relationships are with the small Cuban and Bahaman animals and not with the large race occurring in Porto Rico. The characters of the Porto Rican form, however, can not at present be clearly understood. The type is immature (skull with basal and palatal sutures not fully closed; those of the nasals obliterated) and the second known specimen is still younger. On the basis of this material I have been unable to find any character that distinguishes the animal from *Eptesicus fuscus*. The color appears to be darker than in average specimens of *E. fuscus* from the eastern United States. and the upper canines seem less robust; but it is impossible to decide whether these peculiarities are constant.

Monophyllus cubanus ferreus, subsp. nov.

Type.—Adult male (skin and skull) No. 219151 U. S. National Museum. Collected in a cave 8 miles W. S. W. of Jérémie, southwestern Haiti, December 7, 1917, by Dr. W. L. Abbott.

Characters.—Like *Monophyllus cubanus cubanus*, but color of upperparts clear dark hair-brown with a slight metallic gloss and with no obvious trace of the buffy-brown or fawn-color characteristic of the Cuban race. Measurements as well as cranial and dental characters apparently identical with those of true *M. cubanus*.

Measurements.—Type: head and body, 65; tail, 4; tibia, 17; foot, 11; forearm, 39; condylobasal length of skull, 19.8; mandible, 14.0; maxillary toothrow exclusive of incisors, 7.6; mandibular toothrow exclusive of incisors, 7.8.

Specimens examined.—Twenty-four (two skins), all from the type locality.

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A NEW CRINOID FROM NEW ZEALAND, AND ANOTHER FROM TASMANIA.

BY AUSTIN H. CLARK.

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The development of the crinoid fauna of the waters about New Zealand and Tasmania has been singularly slow, for it is not yet seven years since the first crinoid was recorded from Tasmania, and only a little over a year since the first New Zealand species was described.

At present the following forms are known from these two localities:

NEW ZEALAND.

Comanthus benhami A. H. Clark.
(Proc. Biol. Soc. Washington, vol. **29**, Feb. 29, 1916, p. 48.)

Comanthus novæzealandiæ, sp. nov.

Argyrometra mortenseni A. H. Clark.
(Journ. Washington Acad. Sci., vol. **7**, No. 5, March 4, 1917, p. 129.)

TASMANIA.

Comanthus tasmaniæ, sp. nov.
(*Comanthus trichoptera* [part] A. H. Clark, Mem. Austr. Mus., vol. **4**, part 15, Aug. 17, 1911, p. 755.—*Comanthus spanoschistum* [part] H. L. Clark, Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, June 2, 1916, p. 17 [Maria Island, Tasmania; Bass Strait].)

Comanthus plectrophorum H. L. Clark.
(Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, June 2, 1916, p. 15 [Bass Strait].)

Comissia spanoschistum (H. L. Clark).
(*Comanthus spanoschistum* [part] H. L. Clark, Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, p. 17 [Maria Island, Tasmania; Bass Strait].)

Austrometra thetidis (H. L. Clark).
(Biol. Besults Fishing Exper. F. I. S. *Endeavour*, 1909–14, p. 22 [Bass Strait].)

Ptilometra macronema (J. Müller).
(H. L. Clark, Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, p. 23 [Bass Strait].)
Cosmiometra dasybrachia H. L. Clark.
(Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, p. 24 [Bass Strait].)
Compsometra incommoda (Bell).
(H. L. Clark. Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, p. 25 [Flinders Island].)
Metacrinus cyaneus H. L. Clark.
(Biol. Results Fishing Exper. F. I. S. *Endeavour*, 1909–14, p. 9 [Bass Strait].)

Comanthus tasmaniae, sp. nov.

Description.—The centrodorsal is discoidal, rounded pentagonal in outline, extremely thin, 4 mm. in diameter; the cirri are arranged in a single incomplete and more or less irregular marginal row.

The cirri are XX, 14–16, slender, 10 mm. long; the first segment is broader than long, the second is as long as, or slightly longer than, broad, the third is twice as long as broad, the three following about two and one-half times as long as broad, and their successors rapidly become shorter so that the terminal eight are broader than long; these last are somewhat compressed laterally and in lateral view appear slightly broader than those preceding; with the one or two preceding they each bear a small pointed subterminal tubercle.

The arms are 37 in number, 65 mm. long, and resemble those of *C. trichoptera;* the distal edges of the ossicles of the division series and of the brachials (especially the latter) are strongly everted and finely spinous.

Habitat.—Tasmania; I have examined two specimens, one in the collection of the Australian Museum at Sydney, the other in the collection of the U. S. National Museum (No. 34976).

Remarks.—This species probably includes the multibrachiate examples listed under Dr. H. L. Clark's new species *Comanthus spanoschistum* from Bass Strait and Tasmania. The ten armed specimens, which Dr. Clark especially had in mind when he wrote the description, appear to belong not to *Comanthus*, but to *Comissia*, for the lower pinnules as described agree with those of *Comissia*. Dr. Clark notes the "absence of the peculiar axillaries characteristic of" *Comanthus trichoptera*, and states that "many of the specimens, even the small ones, have the genital pinnules immensely swollen with the reproductive cells."

Comanthus novaezealandiae, sp. nov.

Description.—The centrodorsal is discoidal, irregularly circular in outline, broad, flat and very thin, 5 mm. in diameter; the cirri are arranged in a single irregular and unequally developed marginal row.

The cirri are XIII+, 17, rather slender, 10 mm. to 11 mm. long; the first segment is very short, the second twice as broad as long, the

third from one-quarter to one-third again as broad as long, the fourth about half again as long as broad, the fifth about twice as long as broad, and the sixth nearly as long; the following rapidly decrease in length so that the last seven are broader than long; these are somewhat compressed laterally and therefore broader in lateral view than the preceding; from the fourth onward the distal dorsal border is thickened, this thickening becoming gradually narrower and more prominent in the central portion so that on the last two or three before the penultimate it resolves itself into a low sharp subterminal tubercle; the opposing spine has a transversely broadened chisel like edge.

There are 20 arms, in the specimen at hand all broken off at the base. The distal edges of the ossicles of the division series and of the brachials are very slightly prominent, and are bordered with very fine spines.

Habitat.—Three Kings Island, New Zealand. Dredged on hard bottom in 65 fathoms by Dr. Th. Mortensen, January 5, 1915.

Remarks.—This species differs from *C. tasmaniae*, to which it appears to be most closely related, in having fewer arms, in the lesser length of the earlier elongated cirrus segments, and in the swollen distal borders of the earlier cirrus segments, the distal border of the first seven cirrus segments in *C. tasmaniae* being quite unmodified.

It is easily distinguished from *C. benhami*, from Preservation Inlet, New Zealand, by the fewer arms, the much shorter cirri, and the fewer cirrus segments.

As we know them at the present time the status of the forms related to *C. trichoptera* is very uncertain. Much more material, especially from Tasmania and New Zealand, is needed to clear up the situation.

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NOTES ON DISTRICT OF COLUMBIA JUNCACEAE.

BY FREDERICK V. COVILLE AND SIDNEY F. BLAKE.

In the preparation of the manuscript of the *Juncaceae* for the District of Columbia Local Flora, it has been found necessary to raise a variety of *Juncus canadensis* to specific rank, and to employ new trinomials for two plants which appear to be variants of *Juncoides campestre*. The reasons for these changes are discussed below.

Juncus subcaudatus (Engelm.).

Juncus canadensis var. *subcaudatus* Engelm. Trans. St. Louis Acad. Sci. **2**: 474. 1868.

The distinctive characters of this form, both in habit and in seed, have been recognized so long that it is surprising that the plant has not previously been granted the specific recognition it undoubtedly deserves. *J. subcaudatus* differs from *J. canadensis* J. Gay in its more slender, often lax or decumbent habit; in its looser inflorescence, with fewer-flowered usually much less numerous heads on loosely spreading or sometimes erect branches; and particularly in its very different seeds. In *J. canadensis* the seeds are 1.3 to 1.5 mm. long, including the loose shining whitish testa, which is provided with about 30 to 40 weak longitudinal ribs only very obscurely, if at all, reticulate, and is prolonged at each end into appendages or "tails" which are two-thirds or quite as long as the body of the seed. In *J. subcaudatus* the seed, including the testa, is 0.7 to 0.9 mm. long, and the testa, produced at the ends into appendages only one-third as long as the seed body or less, tightly encloses the distinctly plumper seed and is provided with about 20 to 25 strong longitudinal ribs connected by distinct crossbars so that its surface appears areolate.

In its seed characters *J. subcaudatus* makes some approach to *J. brevicaudatus* (Engelm.) Fernald. The latter, however, has a strict contracted inflorescence of few-flowered heads, and the capsule conspicuously exceeds the perianth.

Material of *J. subcaudatus* is in the National Herbarium from Pennsyl-

vania to North Carolina. It has been reported from Rhode Island to Georgia.

Juncoides campestre bulbosum (Wood).

Luzula campestris β. bulbosa Wood, Class Book 723. 1861.
Juncoides bulbosum Small, Torreya **1**: 75. 1901.

This is here taken as defined by Fernald & Wiegand in Rhodora (**15**: 40, 42) in 1913. It is apparently the less common form of the District.

Juncoides campestre echinatum (Small).

Juncoides echinatum Small, Torreya **1**: 74. 1901.
Luzula campestris var. *echinata* Fernald & Wiegand, Rhodora **15**: 40, 42. 1913.

Apparently the commoner form in the District. Distinguished by the usually strongly divergent branches of the inflorescence and by the fact that the perianth-segments conspicuously exceed the capsule.

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MUTANDA ORNITHOLOGICA.

III.

BY HARRY C. OBERHOLSER.

The present paper is the third* in the writer's series of articles concerning nomenclatorial changes in the names of birds. This treats of some alterations in specific terms in the families Haematopodidae, Scolopacidae, Loriidae, Treronidae, and Columbidae.

Family HAEMATOPODIDAE.

Haematopus quoyi Brabourne and Chubb.

Messrs. Brabourne and Chubb have recently given the name *Haematopus quoyi*† to the bird from the Falkland Islands previously described by Sharpe‡ as *Haematopus ater*. There is, however, an earlier and certainly pertinent name in *Hoematopus townsendi* Audubon,§ based on a specimen supposedly from the mouth of the Columbia River, but which doubtless came, as did others of Audubon's specimens, from South America. In view of this, we designate the Falkland Islands as its type locality. The name for this species should, therefore, now become *Haematopus townsendi* Audubon.

Family SCOLOPACIDAE.

Totanus fuscus (Linnaeus).

The spotted redshank of Europe is now called *Totanus fuscus*, from *Scolopax fusca* Linnaeus.‖ This name, however, is preoccupied by *Scolopax*

*For the two previous papers, *cf.* Proc. Biol. Soc. Wash., XXX, March 31, 1917, pp. 75–76; and Proc. Biol. Soc. Wash., XXX, July 27, 1917, pp 125–126.

†Birds South Amer., I, December, 1912, p. 37.

‡Cat. Birds Brit. Mus., XXIV, 1896, p. 121.

§Birds Amer., folio ed., IV, 1838, pl. 427, fig. 2 ("mouth of the Columbia River, Oregon.").

‖Syst. Nat., ed. 12, I, 1766, p. 243 (Europe).

fusca Linnaeus,* which is apparently the same as *Guara alba* (Linnaeus). The earliest tenable name for *Totanus fuscus* of authors is apparently *Scolopax maculata* Tunstall,† which the author's reference to Pennant's British Zoology saves from being a nomen nudum. The species should, therefore, now stand as *Totanus maculatus* (Tunstall).

Family LORIIDAE.

Eos riciniata (Bechstein).

The name of this lory in general use‡ is antedated by at least three others. Dr. R. B. Sharpe§ has used for it *Eos variegata* (Gmelin);‖ but the earliest of its specific designations is *Psittacus guenbyensis* Scopoli,¶ which, though from an impossible locality, is of apparently undoubted application. The species should therefore stand as *Eos guenbyensis* (Scopoli).

Family TRERONIDAE.

Leucotreron gularis (Quoy and Gaimard).

The *Columba gularis* of Quoy and Gaimard,** which is the present *Leucotreron gularis*, from Celebes, is preoccupied by *Columba gularis* Wagler,†† which is a synonym of *Coturnicoenas hottentotta* (Temminck), a fictitious bird of Levaillant's. As *Leucotreron gularis* has no other name, it may be called **Leucotreron epia,** nom. nov.

Family COLUMBIDAE.

Gymnopelia erythrothorax (Meyen).

The name now employed for this South American species, *Columba erythrothorax* Meyen,‡‡ is untenable because of *Columba erythrotorax* [sic] Temminck,§§ which is probably the same as *Aplopelia larvata* Temminck. The next available name is *Columba* (*Chamœpelia*) *cecilioe* Lesson‖‖, and

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* Syst. Nat., ed. 10, I, 1758, p. 145 (South Carolina).

† [*Scolopax*] *Maculata* Tunstall, Ornith. Brit., 1771, p. 3 (Great Britain).

‡ *Ps*[*ittacus*]. *riciniatus* Bechstein, Latham's Allgem. Übers. Vögel, VII, 1811, p. 69, pl. 4 (Molucca Islands).

§ Hand-List Gen. and Spec. Birds, II, 1900, p. 2.

‖ [*Psittacus*] *variegatus* Gmelin, Syst. Nat., I, pt. 1, 1788, p. 319 (India).

¶ *Psittacus guenbyensis* Scopoli, Del. Flor. et Faun. Insubr., II, 1786, p. 87 ("China"; locality wrong; doubtless came from Molucca Islands; therefore we designate Gilolo Island as the type locality).

** Voy. Astrolabe, Zool., I, 1830, p. 247, pl. 29 (Manado, Celebes).

†† Syst. Avium, 1827, Columba, sp. 90, p. 261 (Namaqua Land, South Africa).

‡‡ Nov. Act. Acad. Leopold.-Carol., XVI, Suppl., 1834, p. 98, t. XVI (province of Arequipa, Peru).

§§ Hist. Nat. Gén. Pigeons, I, fam. trois., 1808–1811, p. 15, pl. VII (Surinam).

‖‖ Echo du Monde Savant, XII, 1845, p. 8 (Peru). This was later remamed *Columba* (*Chamœpelia*) *anais* by Lesson, in Compl. Oeuv. Buffon, XX, 1847, p. 210 (Peru).

the bird should stand, therefore, as *Gymnopelia cecilioe* (Lesson). The *Columba monticola* of Tschudi* is possibly of equal or earlier date, but is rendered useless in any case because of the prior *Columba monticola* Vieillot,† a synonym of *Columba squamosa* Bonnaterre.

The name *Columba anais* Lesson has by some authors been employed for this species, and has sometimes been dated from the Echo du Monde Savant, XII, 1845, p. 8; but it was really first published in 1847,§ two years later than *Columba cecilioe* Lesson.

* Fauna Peruana, Ornith., 1845–1846, pp. 45, 276 (Cordillera, Peru) (nom. nov. pro *Columba erythrothorax* Meyen).

† Nouv. Dict. d'Hist. Nat., XXVI, 1818, p. 355 (Santo Domingo).

‡ Compl. Oeuv. Buffon, XX, 1847, p. 210.

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NOTES ON CLEMMYS.

BY ALBERT HAZEN WRIGHT.

The interesting record of Muhlenberg's Turtle in Rhode Island presented by Dr. H. L. Babcock in the April, 1917, Copeia prompted the writer to assemble all of our western New York records of that form and what we have of interest concerning its habits, breeding and distribution. These notes are forthcoming in another place and hence are omitted here. Subsequently, Mr. E. R. Dunn described a new species of *Clemmys* from North Carolina and this furnishes one of the occasions for these observations on the genus in general. His *Clemmys nuchalis* is herein compared with western New York material and held to be synonymous with *C. muhlenbergi* (Schoepff). *Clemmys marmorata* (B. & G.) is not treated in these remarks.

Clemmys muhlenbergi (Schoepff).

In his very interesting and valuable paper on reptiles and amphibians from the mountains of North Carolina, Mr. E. R. Dunn* records four Muhlenberg's Turtles, one from Linnville, N. C., at 4,200 feet altitude, and three from Brevard, N. C., at 2,100 feet altitude. He calls attention to the fact that these are at a much higher altitude than the records of most of the northeastern specimens which were taken mainly below 100 feet. A glance at the distribution of the Pennsylvania, New Jersey, New York and Rhode Island records shows such a close correspondence to the northeastern arms of the Upper Austral zone that it has prompted the author to examine the records of western New York. All of them come within the Upper Austral zone if we can think of sphagnaceous or marly areas as having Upper Austral influences in this latitude. In western New York this species has been taken at Ithaca at 400 feet, at Bergen (near Rochester) at 580–600 feet, at Junius (near Geneva) at 480–500 feet and at Westbury (near Oswego) at 420–440 feet. Strangely

* Bull. Amer. Nat. Hist., Vol. XXXVII, pp. 593-634.

enough, these 400–600 foot contours come where Merriam's Upper Austral arm of the southern shore of Lake Ontario is about to merge into the Transition zone; and the appearance at Ithaca is a southern austral extension of the Ontarian arm of the Upper Austral zone. It seems reasonable to prophesy that subsequent records in western New York will doubtless come below the 600–700 foot contours. If this species then be an Upper Austral form near the edge of the Transition zone we ought to find it at a higher altitude in North Carolina than in New York just as Mr. Dunn recorded it. And, herein, we begin to get some sort of a key to the apparent discontinuous records of this rare turtle.

In the light of this distribution and what follows it seems decidedly open to question whether or not the North Carolinian specimens should be considered a new species, *Clemmys nuchalis*.

Four characters enter into the diagnosis of this supposed new form and are given as follows: "a longer nuchal plate, with the temporal blotch forked ventrally, and the female, at least with a flatter and broader shell."

Of the nuchal plate in these North Carolinian turtles we have the following:

"The length of the nuchal plate ranges from 6 mm. to 7.1 mm. in the female *nuchalis*, and from 4 mm. to 6 mm. in female *muhlenbergi*. It is included in the length of carapace of female *muhlenbergi* from 13.6 to 16.4 times, and in that of female *nuchalis* from 12.7 to 13.2 times. No variation with age is apparent.

"The one male (*nuchalis*) agrees in bodily proportions with male *muhlenbergi*,—.

"The nuchal plate of the one male is 8 mm. long. Nuchals of male *muhlenbergi* range from 4.9 to 7 mm. in length. They are contained in the carapace 12.8 to 19 times, while that of *nuchalis* is included 12.2 times."

The nuchal plate in ten specimens varies in the males from 6 mm. to 8 mm. in length and from 2.5 mm. to 4.0 mm. in width, while in the females it is from 5.5 mm. to 7.5 mm. in length and 3.0 mm. to 3.5 mm. in width. The nuchal in the females is contained in the length of the carapace from 11.5 to 14.9 times; in the males, 12.3 to 14.8 times; and in a newly hatched young, 13.6 times. Accordingly these female *muhlenbergii* are more like the *nuchalis* diagnosed above and less like the *muhlenbergi* there given. The newly hatched young has the nuchal almost square, 2.5 mm. long and 3.0 mm. wide, i. e., wider than long and yet at adulthood the greater measurement comes in the length. The plate is quite variable in this transformation to a long narrow plate and the relative changes come in the width and not in the length of the plate. One of the adult males has no nuchal plate and a cephalic prolongation of the first neural replaces the obliterated nuchal.

Of the length, width and height of carapaces of these two forms, *C. nuchalis* and *C. muhlenbergi*, we have the following:

"The range in length of carapace of *C. nuchalis* is in the females 79–93 mm., the male measuring 98 mm.

"In *muhlenbergi* the same measurement gives for females 60–90 mm., and for males 84–98.

"— — ·—"

"With age, females of *muhlenbergi* show a gradual decrease in proportional width. They are always proportionally higher than female *nuchalis*. When small, female *muhlenbergi* are as broad as female *nuchalis*, but the adults are narrower. Thus, in females of *muhlenbergi* the width forms 72.22 to 81.6 per cent of the length. The same ratio in female *nuchalis* is 75.93 to 78.65 per cent. If, however, we omit the smallest two *muhlenbergi*, leaving in our ratios only those forms over 79 mm., we have for *muhlenbergi* 72.22 to 75.08, and for *nuchalis*, 75.93 to 78.65. The height forms 44.11 to 46.66 per cent of the length in female *muhlenbergi*, and 41.23 to 43.85 per cent in female *nuchalis*. The height of female *muhlenbergi* does not seem to change with age as the extremes of the above ratios are represented by the small ones. The ratio of height to width for female *muhlenbergi* is 55.55 to 63.33 per cent, for *nuchalis* 52.42 to 57.74 per cent, but omitting again the two small specimens of *muhlenbergi*, we have for that species 59.25 to 63.33 per cent."

The range in length of carapace of our females of *C. muhlenbergi* is from 82–93 mm., while in the males it is from 82–98.5 mm. In width the males are from 58.5–69 mm., and the females, 61–68.5 mm. The width forms 65.7–72.5 per cent of the length of our males, 73–76.7 per cent in the females, and 83.8 per cent in a newly hatched young. In height the males vary from 32–39 mm. and the females, from 37–39 mm. The height forms 36.5–41.0 per cent of the length of our males, 39.7–47.0 per cent in the females and 39.7 per cent in a newly hatched young.

In the accompanying plate figures 1 and 2 are tracings from the original description of *C. nuchalis* and the temporal spot appears in black in all the figures. The illustrations from eleven specimens considered in this paper show such variation that the shape or forking of the temporal spot proves most uncertain in characterizing these forms.

All in all it seems best to the writer to consider these North Carolinian forms as *C. muhlenbergi* and to expect specimens in intermediate places between Pennsylvania and North Carolina. The measurements of ten *C. muhlenbergi* follow:

Locality	Date	Sex	Carapace			Nuchal
			length	width	height	
Junius, N. Y.	July 18, 1908	♂	86	60	33.5	
Bergen, N. Y.	July 22, 1917	♂	82	59.5	32	6.5 x 3.5
Hackensack, N.J.	June 12, 1909	♂	89	58.5	36	6.0 x 2.5
Ithaca, N. Y.		♂	96	65.0	39	7.5 x 3.5
" "	May 5, 1915	♂	93	64.5	36	6.5 x 3.5
" "	April 9, 1910	♂	95.5	66.0	38	6.5 x 4.0
" "	June 10, 1917	♂	98.5	69.0	36	8.0 x 3.5
" "	April 9, 1910	♀	88.0	67.5	39	7.0 x 3.5
" "	May, 1908	♀	83.5	61.0	39	7.5 x 3.5
" "	June 10, 1917	♀	93.0	68.5	37	6.5 x 3.5
Junius, N. Y.	May 26, 1906	♀	82.0	61.0	39	7.5 x 3.5
Junius, N. Y.	July 18, 1908	yg	34.0	28.5	13.5	2.5 x 3.0

1. *Clemmys nuchalis* Dunn. His figure No. 6, Linville, N. C., Aug. 17, 1916.
2. *Clemmys muhlenbergi* (Schoepff). His figure No. 7.
3. " " Junius, N. Y., July 18, 1906. Newly hatched.
4. " " Junius, N. Y., May 26, 1906. Adult female.
5. " " Junius, N. Y., July 18, 1906. Adult male.
6. " " Ithaca, N. Y., May 5, 1915. Adult male.
7. " " Ithaca, N. Y. Adult male.
8. " " Ithaca, N. Y., April 9, 1910. Adult female.
9. " " Ithaca, N. Y., April 9, 1910. Adult male.
10. " " Ithaca, N. Y., June 10, 1917. Adult female.
11. " " Ithaca, N. Y., June 10, 1917. Adult male.
12. " " Bergen, N. Y., July 22, 1917. Adult male.
13. " " Hackensack, N. J., June 12, 1909. Adult male.

Clemmys insculpta (LeConte).

Our records of first appearance in the spring for the wood turtle vary between the two extremes of March 20, 1915, and May 14, 1906, and we have one mid-winter appearance on January 26, 1913. Three of the records come in April, two in March, and two in May. An average date at Ithaca, N. Y., appears to be about April 20. The records follow: May 14, 1906; April 27, 1908; March 28, 1910; April 27, 1912; April 20, 1913; May 3, 1914; March 20, 1915. All of these individuals were taken along our stream valleys or actually in the streams.

During the summer months we seldom see this species. It seems to be in the months of May and June that this species breeds. In our Cayuga Inlet valley through which a railroad (Lehigh Valley R. R.) runs we sometimes find them in late May or early June travelling along the railroad tracks or along the paralleling stream.

Some evidence discovered in 1914 may indicate an early May breeding or mating. In a semi-open sandy area of the Inlet valley where two side-streams open into it from different sides we found five of these turtles within a small area. Small willows furnished the only shade. Amongst the grass, against the sand or beside bunches of driftwood we found them. All looked so like the dirty sand that it was hard to find them. They were all females except one. On the same day in the same valley two other parties reported four or five more. One man captured one male and put it in a laundry bag but forgot it. About a week later he found it in good condition where he had left it.

Some of these turtles were brought home and for the first day we temporarily put them in a box in the kitchen. They soon got out and while we were at lunch in an adjoining room we heard a distinct yet subdued note not unlike that of a tea-kettle. We discovered that the male wood turtle was the whistler. We could hear the whistle 30 or 40 feet away. Whenever we brought the male to the middle of the room he would whistle. Once a female responded but its note was not very loud. Finally, we noticed that whenever a male approached a female he would

stick his head in close to the withdrawn head of the female and make the curious note. These observations were frequently made with these turtles.

The eggs probably hatch as a general rule in the fall, but a small wood turtle taken April 20, 1913, in the water of a small stream was a newly hatched form. It looked as if hatched that spring yet it may possibly have been hatched very late the previous fall. This specimen has its carapace 32 mm. long x 30 mm. broad, quite unlike the proportions of an adult male, 19.2 cm. x 13.6 cm., while two intermediate specimens have the following: 5.9 cm. x 5.5 cm.; 13.5 cm. x 11 cm. In this small specimen the posterior end of plastron is a real round emargination while in adults it is a straight-sided notch. In this newly hatched young, the concentric rings to come are only indicated at the periphery of each plate by a row of large tubercles. In the next older specimens the concentric lines move in development from the circumference toward the center and the radii are more prominent than the circuli. In the young specimens this central area is quite rough but in adults the small depressed center which is left becomes smooth.

In the fall of the year we find these turtles from September 20–October 15. Then, as in the spring, they are near or actually in our streams. This fall on October 1, I chanced on what I mistook for a dead wood turtle in the dammed up stretch of a woodland stream, which was 4 feet wide and 1 or 2 feet deep. The head was hanging perpendicularly downward as if it were caught or held by something. Upon endeavor to move it the turtle seemed very heavy and soon to my surprise it proved the male of a mated pair. The head looked to be hooked between the edge of the carapace and plastron of female turtle. Apparently this was not for purposes of holding the female but like the action of the whistling male previously recorded. The female's head looked to be retracted and the male's head had followed to the withdrawn head of the female. After these turtles were taken from the water the writer could not verify the actual head relations nor see the actual cloacal contact. For several minutes the male however maintained its grasp. With the prominent fore-claws the male held on the edge of the female's carapace near the suture between the first and second cephalic plates. The space between these two feet was barely the width of the male's head. The hind claws similarly held the next to the last pair of caudal marginals.

Oftentimes the texts mention that the tails of male turtles are larger than those of the females but the emphasis should be laid on the fact that the exposed preanal part of the tails of male wood turtles as in other species is twice as long as the corresponding part of the female's tail. The concavity of the plastron helps to accomplish ease of mating, but this elongation of the whole tail plus the pushing of the anus twice as far back greatly helps in the process.

Besides these sexual differences of structure already enumerated the scales on the front parts of the limbs, particularly of the fore-legs, are much more prominent in the male. The claws of the male are longer

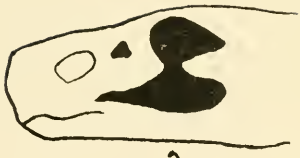
and especially much heavier than the corresponding shorter and more slender claws of the female. The plastra are different. In addition to concave male and convex female plastral characters, we find that there is another distinction. The rear edge of the plastron of the female may almost reach the corresponding edge of the carapace. For example, in two specimens of equal length (7 inches) the rear edge of the plastron of the female is only .5 cm. from the corresponding part of the carapace, but in the male 2 cm. separate the two edges.

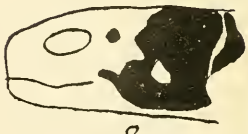
Many years ago the author found a mated pair of painted turtles in mid-August but this late mating just preceding entrance into hibernation seems quite unusual. Inasmuch as many male turtles in courtship endeavor to get in front of the females or stick their heads toward the withdrawn head of the females it may be that in their attempt to grasp the front edge of the carapace with their long claws the males may accidentally flay the females. That deliberate flagellation occurs and that the claws are longer for such a function seems rather far fetched.

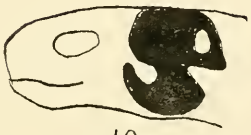
The female of this October 1 pair was lost by a friend but the male was retained for a month. About October 20 it strove to dig into the gravel of our cold cellar, the windows of which were open. Later we brought it to the laboratory and for a week it sought to find a dark corner for hibernation. It annoyed the students in its walking around so that it was put into a big hamper waste basket over 2.5 feet high. This basket had bulging sides and a smaller diameter at the top. From the bottom of this basket it would climb up on the inside and surmount the rim where it balanced awhile. Finally it would tumble to the floor. It repeated this climbing act eight different times and sometimes the students would put the basket beside them but frequently the turtle was so quiet that it would be at the parapet balancing before the student would be aware of its climbing.

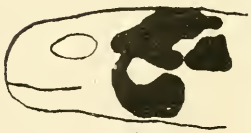
Clemmys guttata (Schneider).

This best known N. A. form of this genus we do not propose to discuss at length except to present a few of our records of its occurrence. Our early dates of first appearance in the spring are April 3, 1903, at Hilton, N. Y. (near Rochester), April 5, 1909, at Auburn, N. Y., and April 7, 1909, at Hamburg, N. Y. (near Buffalo). It does not occur at Ithaca, N. Y., nor in the southern tier of western New York counties so far as can be determined. In the Upper Austral stretch from Oswego to Buffalo it occurs regularly. At Fort Erie, Ontario, we secured it in the last of June, 1914, in some drainage ditches which were put through a sphagneous area behind Crystal Beach. At Hamburg, New York, we took it in the same swampy woods in which *Hemidactylium scutatum*, *Ambystoma jeffersonianum* and *Pseudacris feriarum* lived. Near Rochester, as about Buffalo, it is not the turtle of our streams nor of the cat-tail swamps. Here the painted turtle is the common form. At Hilton,









Heads of *Clemmys muhlenbergi*.

N. Y., we occasionally find it in mucky peaty ponds. But in the sphagnum pockets and marly ponds across the State it is the common form. In the Junius marl ponds we frequently take it in the ponds, in connecting streams and in the sphagnum. At Bergen, N. Y., it is also recorded as at Westbury and Spring Lake, N. Y.

In this later region above Port Byron, N. Y., the species is abundant in every pond or swampy place in wet woods if the soil be of the black muck type. In the sphagnum bogs they were frequently captured on the top of the sphagnum where their diggings look like a little pile of finely broken dead sphagnum which is brown in comparison to the green surrounding it. The query naturally arises as to whether or not the species lays in these brown piles of sphagnum. We have secured many of them on these piles or near them in late May and in June while orchid hunting. Sometimes the head and front half of the body would be buried in the sphagnum.

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PROCEEDINGS
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NOTES ON THE BEE GENUS ANDRENA (HYMENOPTERA).

BY HENRY L. VIERECK.

In checking up the specific names of *Andrena* of the world a number of names were found to be preoccupied. In the following list, it is believed, the renaming of the remaining preoccupied names is completed.

Andrena parviceps var. **basilaris,** n. n. for **parviceps** var. **basalis** Kriechbaumer, Ver Zool. Bot. Jes. Wien, 23 (56), 1873, not *basalis* Dours, Rev. & Mag. Zool. 23 (354), 1872.

Andrena plesia, n. n. for *consimilis* Alfken, Ent. Machr. 26 (177), 1900, not *consimilis* Smith, Zool. 5 (1736), 1847.

Andrena ephippium dorsatula, n, n. for *ephippium* var. *dorsalis* Le Peletier, Hist. Nat. Ins. Hym. 2 (235), 1841, not *dorsalis* Brullé, Exped. Sc. Moree Zool. 2 (358), 1832.

Andrena panurgoides, n. n. for *panurgina* Perez, Pr. Verb. Soc. Bord. 58 (lxxxvii), 1903, not *panurgina* De Stefani, Nat. Sci. 8 (205), 1889.

Andrena amanda, n. n. for *pretiosa* Morawitz, Horae Soc. Ent. Ross. 28 (65), 1894, not *pretiosa* Schmiedeknecht, Ent. Nachr. 6 (14), 1880.

Andrena quadrifasciatula, n. n. for *quadrifasciata* Morawitz, Fedt. Turk. Melt. 11 (260), 1876, not *quadrifasciata* Gmelin, Linnaeus, Syst. Nat. 1 (792), 1790.

Andrena simulatilis, n. n. for *simulans* Perez, Bull. Mus. Hist. Nat. Paris 11 (34), 1905, not *simulans* Perez, Pr. Verb. Soc. Bord. 58 (lxxxiii), 1903.

Andrena smaragdula, n. n. for *smaragdina* Schmiedeknecht, Termes. Fuzetek, 23 (227), 1900, not *smaragdina* Morawitz, Fedt. Turk. Mell. 11 (211), 1876.

Andrena sordidella, n. n. for *sordida* Morawitz, Fedt. Turk. Mell. 11 (173), 1876, not *sordida* (Scopoli), Ent. Carn. (299), 1763.

Andrena winkleyi Viereck, Ent. News 18 (283), 1907. This is a synonym of *Andrena wilkella* (Kirby).

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OCCURRENCE OF A EUROPEAN SOLITARY BEE (ANDRENA WILKELLA KIRBY) IN THE EASTERN UNITED STATES.

BY J. R. MALLOCH.

I have always been particularly careful in my publications on North American insects to guard against the danger of recording any European species as occurring here without actual comparison of specimens eminating from the different continents. I can not help but believe that some of my fellow entomologists consider my attitude towards certain records of Diptera pertaining to species supposed to occur here and in Europe to be rather one of natural perversity than of caution, but I certainly feel that a conservative attitude should be maintained in the matter of widening the published range of species because of the confusion an error in identification may create in future references to such species even after the error has been rectified in print.

When insects feed upon particular plants it frequently occurs that in the transportation of their host plant the associated insect species are carried from one part of the country to another or from one country or continent to another, and the natural distribution of the insects is thus, by artificial means, very materially enlarged. Scavenging species in various orders find in the commercial vessel plying between ports in different parts of the world a ready means of distribution, and many such insects are of world-wide occurrence.

We have in the past had statements of the occurrence of several European species of *Andrena* in North America, but these records were subsequently suppressed, and attributed to errors in identification. That some European species of this genus

probably do occur in this country has been my belief for a considerable time because of the evident possibility of some of the early spring species having been shipped here in winter or early spring, either in earth used as ballast or around potted plants, during the period when such imports were uninspected on arrival.

Provided a species obtained access to this country under such conditions it could establish itself very readily if the plants upon which it depended for pollen were available. Most of the early spring species of western Europe, and particularly of Britain, depend upon willow, dandelion, coltsfoot, furze, and various fruit blossoms, for their food supply. Most of these plants are found in New England, and, in fact, throughout the United States, so that conditions in so far as food supply is concerned are favorable. It is of course improbable that specimens of imported species would come singly, as they usually nest in colonies, and a spadeful of earth may carry twenty specimens and contain both sexes.

The species which I record herewith is one that occurs throughout Europe and is one of the earliest visitors to willow flowers. I have dug imagines of both sexes out of a sand bank in Scotland before the middle of March. They were at a depth of about eight inches.

Saunders uses for this species Kirby's name *wilkella*, differing from Schmiedeknecht, who used the same author's species name *xanthura*. The species is known in this country under the name *winkleyi* Viereck.

I have before me a series belonging to my own collection, obtained in Britian, which I have compared with a long series submitted for identification from Cornell University, obtained at Ithaca, Rochester Junction, Rock City, and McLean Bogs, New York. The species is intermediate between Robertson's subgenus *Trachandrena* and *Andrena*, the male having the third antennal joint very much shorter than the fourth, and the hypopygium very similar to that of *claytoniae* and allied species. The metathoracic enclosure is similar to that of *cressoni* Robertson, and the female resembles the latter very strikingly. The abdomen has the surface so closely and coarsely shagreened that it has the appearance of having a secondary punctuation at base and apex of each dorsal segment in addition to the large punc-

tures, and the basal nervure is very much proximad of the median transverse nervure—characters which readily separate the species from any other known to me occurring in the eastern United States.

Viereck describes *winkleyi* from Branford, Conn., and records it from New Haven, Conn. He gives records of its visiting flowers of quince, raspberry, and gooseberry.

A male from the collection of N. Banks, taken at Ithaca, bears the record, "Wild cherry."

Occurs from May 14 to June 28 according to data on specimens.

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PROCEEDINGS

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NOTES AND DESCRIPTIONS OF SOME ANTHOMYIID GENERA.

BY J. R. MALLOCH.

The matter contained in this paper is presented now in order to make possible the subsequent presentation of generic keys to the family Anthomyiidae. The generic concepts of different authors are vague and varied, and with a view to clearing up the generic status of at least the American forms I have obtained from Dr. Villeneuve and Mr. P. H. Grimshaw genotypes of many of the European genera upon which I have based my generic concepts. The limits of these genera do not coincide with those defined by European authors, probably owing to the fact that the characters now used by me were ignored or overlooked by those authors, or else consideration of genotypes was deemed unnecessary by them.

Mydaea Robineau Desvoidy.

Genotype, *Musca pagana* Fabricius.

This genus contains about six North American species. The described species known to me are, *pagana* Fabricius, *urbana* Meigen, *obscura* Stein, *nigricolor* Fallen. The last species I have a slight doubt about, as I have not compared it with European material; the specimens are from Plummer's Island, Md., and Little Falls, D. C. (W. L. McAtee).

The third vein is bristly at base in both sexes and the female has the penultimate genital segment armed with spines on venter.

Aricia Robineau Desvoidy.

Genotype, *Musca impuncta* Fallen.

The genotype differs from *Phaonia* R. D. in having no calcar on hind tibia. There are many North American species of this genus.

Phaonia Robineau Desvoidy.

Genotype, *Phaonia viarum* R. D., = *Musca erratica* Fallen.

Differs from both *Mydaea* and *Aricia* in having a strong bristle (calcar) on postero-dorsal surface of hind tibia, well beyond middle.

There are many North American species.

Pseudophaonia, gen. nov.

Genotype, *Aricia orichalcea* Stein.

Distinguished from *Phaonia* by the very conspicuous clump of hairs on center of pteropleura.

Monobasic.

Ariciella, gen. nov.

Genotype, *Ariciella flavicornis*, sp. n.

Generic characters.—Eyes closely approximated above; proboscis normal. Prealar bristle absent or minute; hypopleura hairy above in front, and below spiracle; ventral pronotal plate in part hairy. Hind tibial calcar absent. Third vein bare at base, not bent forward at apex.

Ariciella flavicornis, sp. n.

Male.—Black, opaque, densely covered with pale gray pruinescence. Antennae, palpi, greater portion of scutellum, legs except tarsi, and the halteres yellowish testaceous. Thorax quadrivittate. Abdomen with 2 black spots on third (second visible) and 2 on fourth segments, central dark line on dorsum indistinct. Wings clear.

Eyes slightly pubescent, separated above by about the width across posterior ocelli; third antennal joint nearly 5 times as long as wide; arista with very long plumes; cheek about one-eighth as high as eye. Thorax without presutural acrostichals, with 3 pairs of strong postsutural dorso-centrals, and 2 strong intra-alars. Abdomen narrow, slightly ovate. Fore tibia without median bristles; mid femur with 4–5 bristles on basal half of postero-ventral margin; mid tibia with 2 posterior bristles; hind femora with 4–5 long bristles on apical half of antero-ventral surface; hind tibia with 2 antero-ventral bristles, and 1, stronger, on antero-dorsal surface; posterior surface with 4–5 setulae, the upper one just about middle. Veins 3 and 4 very conspicuously divergent apically; outer cross-vein distinctly curved.

Length, 6.5 mm.

Type locality, Brownsville, Texas, November 22, 1910 (C. A. Hart).

Trichophticus Rondani.

Genotype, *Aricia hirsutula* Zetterstedt.

This genus is represented by about half a dozen species in North America.

I can not find characters that in my opinion warrant the separation of *Alloeostylus* from this genus. The stouter build of the species of *Alloeos-*

tylus is the only character that might be used in their separation, and that does not appear to me to be sufficient grounds for the retention of *Alloeostylus*.

Achaetina, gen. nov.

Genotype, *Musca ciliata* Fabricius.

Lioy erected the genus *Microcera* for this species in 1864, but that name had been used previously by Meigen (1803) and Zetterstedt (1838). At present the species is included in *Hydrotaea*.

The genus is separable from *Hydrotaea* by the absence of the anterior intra-alar bristle and the presence of numerous hairs on the upper part of the hypopleura anterior to the spiracle.

The genotype has been recorded from North America. A second species occurs on this continent, *cressoni* Malloch. I included both of these species in my recent synopsis of *Hydrotaea*.*

Eremomyioides, gen. nov.

Genotype, *Eremomyia cylindrica* Stein.

This genus is distinguished from all other Anthomyiidae known to me by the presence of hairs on all parts of pleurae including the exposed lateral and ventral areas of prothorax.

The genus *Eremomyia* Stein is not easily separated from *Hylemyia*, and certainly not invariably so, by the duplication of the posthumeral bristle, as many species that undoubtedly belong to *Hylemyia* have the seta laterad of the posthumeral strong and bristle-like. It is unfortunate that Coquillett selected *humeralis* as the genotype instead of *cylindrica*.

There are three species of *Eremomyioides* known to me, *cylindrica* Stein, *setosa* Stein, and *parkeri*, sp. n.

The species may be separated as follows:

Females.

1. Apical dorsal segment (fourth visible) of abdomen obtusely rounded, curved over apex of abdomen and armed with closely placed long bristles, appearing tufted; genital segments retracted within a small orifice in venter near apex; femora black except at apices; hind tibia with 4–5 postero-dorsal bristles . . . . . *parkeri*, sp. n.

— Apical dorsal segment of abdomen not obtusely rounded and curved over apex of abdomen, truncate, the genital segments withdrawn into an apical opening, the fourth segment with a few sparse bristles, not appearing tufted 2

2. Femora black; costal setulae much longer on basal half of wing than diameter of costal vein, the longest one at least twice that length; hind tibia with a bristle on anterior surface midway between the antero-dorsal and antero-ventral bristles . . . . . *setosa* Stein

— Mid and hind femora reddish; costal setulae but little, if any, longer than diameter of costal vein; no bristle on anterior surface of hind tibia . . . . . *cylindrica* Stein.

* Bull. Brooklyn Ent. Soc., Vol. 11, p. 108, 1916.

I have examined the types and a large number of additional specimens from various collections of *cylindrica*, and the type female of *setosa*. The new species agrees in general habitus with the other two, differing essentially only in being about 8.5 mm. in length and as stated in synopsis. Like *setosa*, it has the posthumeral bristle single or with a small anterior setulose hair, and the costal setulae are longer than the costal diameter. In color all the species are similar, the only difference being in the color of the femora, as stated in synopsis.

Type locality of *parkeri*, Bozeman, Montana, April and May, 1916. Paratype in collection of Montana Agricultural Experiment Station.

Named in honor of Dr. R. R. Parker, who submitted the material.

Emmesomyia Malloch.

The type of this genus is *unica* Malloch.

I have examined the type specimens of *Spilogaster socialis* Stein, and find that the species belongs to *Emmesomyia*. The only differences that I can find between the types of the two species lie in the comparative lengths of the hairs of the arista and in the slightly larger size of *socialis*. In the latter the hairs of the arista are much longer than in *unica*, the longest being distinctly longer than the width of the third antennal joint in the male, while in *unica* it is distinctly less. Otherwise the species agree closely. An examination of the male hypopygium and of more specimens of each will be necessary to determine the specific distinctions. The fifth ventral abdominal segment in the two species is apparently structurally the same and quite distinct in armature from that of *apicalis* Malloch—the only other species known to me.

Calythea Schnabl and Dzeidzicki.

Genotype, *Anthomyia albicincta* Fallen.

On pages 273 and 274 of their large work on Anthomyiidae Schnabl and Dzeidzicki enumerate the distinctions and affinities of *Anthomyia albicincta* Fallen, and express the opinion that it should form a new subgenus of *Pegomyia* with the name *Calythea*.

No mention is made in the discussion of the presence of hairs on the upper anterior portion of the hypopleura, a character sufficiently rare in Anthomyiinae to entitle a species to generic rank.

The hypopleural hairs associate the species with those in *Phaonia*, and the hypopygial characters are somewhat similar, but the presence of hairs on the ventral surface of the scutellum, the existence of a bristle on the ventral surface of the basal joint of the hind tarsus, the complete sixth wing-vein, and the general habitus of the species unmistakably connect it much more closely with Anthomyiinae.

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PROCEEDINGS

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A LIST OF FAMILIES AND SUBFAMILIES OF ICHNEUMON-FLIES OR THE SUPER-FAMILY ICHNEUMONOIDEA (HYMENOPTERA).

BY HENRY L. VIERECK.

In the following list the supergeneric groups of the Ichneumonoidea are systematically arranged according to the writer's latest views. To avoid confusion in referring to groups of genera by word of mouth, all tribes are treated as subfamilies.

Family **Vipionidae** Viereck.
- Subfamily **Opiinae** Cresson.
- Subfamily **Cardiochilinae** Ashmead.
  (*Cardiochiles* Nees, etc.)
- Subfamily **Microgasterinae** Cresson.
  (*Microgaster* Latreille, etc.)
- Subfamily **Mesocoelinae**, new subfamily.
  (*Mesocoelus* Schulz.)
- Subfamily **Apantelinae**, new subfamily.
  (*Apanteles* Foerster, etc.)
- Subfamily **Miracinae**, new subfamily.
  (*Mirax* Haliday.)
- Subfamily **Elasmosominae**, new subfamily.
  (*Elasmosoma* Ruthe, etc.)
- Subfamily **Adelinae**, new subfamily.
  (*Adelius* Haliday, etc.)
- Subfamily **Vipioninae** Gahan.
  (*Vipio* Latreille, etc.)*

Family **Agriotypidae** Haliday.
(*Agriotypus* Walker.)

Family **Alysiidae** Ashmead.

* The length of the submedian cell is too unstable to warrant its use as a foundation for groups of genera, hence Aphastobraconini and Euurobraconini are not adopted here.

Subfamily **Alysiinae** Cresson (part).
(*Alysia* Latreille, etc.)
Subfamily **Alloeinae**, new subfamily.
Alloea Haliday, etc.)
Subfamily **Dacnusinae** Cresson.
(*Dacnusa* Haliday, etc.)
Family **Lysiognathidae** Ashmead.
(*Lysiognatha* Ashmead.)
Family **Vanhorniidae** Crawford.
(*Vanhornia* Crawford.)
Family **Stephanidae** Haliday.
Stephanus Jurine, etc.)
Family **Paxylommidae** Viereck.
(*Paxylomma* Prebisson.)
Family **Banchidae** Viereck.
Subfamily **Banchinae,** new subfamily.
(*Banchus* Fabricius, etc.)
Subfamily **Zemiophorinae,** new subfamily.
(*Zemiphora* Foerster).
Subfamily **Diplazoninae**=*Bassides* Morley), new subfamily.
(*Diplazon* (Nees), etc.)
Family **Capitoniidae** Viereck.
(*Capitonius* Brullé.)
Family **Braconidae** Haliday (part).
Subfamily **Macrocentrinae** Cresson (part).
(*Macrocentrus* Curtis, etc.)
Subfamily **Zelinae,** new subfamily.
(*Zele* Haliday, etc.)
Subfamily **Helconinae** Cresson (part).
(*Nelcon* Nees, etc.)
Subfamily **Diospilinae,** new family.
(*Diospilus* Haliday, etc.)
Subfamily **Ichneutinae** Cresson.
(*Ichneutes* Nees, etc.)
Subfamily **Blacinae** Cresson (part).
(*Blacus* Nees, etc.)
Subfamily **Leiophroninae,** new subfamily=(*Calyptides* Marshall).
(*Leiophron* Nees, etc.)
Subfamify **Meteorinae** Cresson.
(*Meteorus* Haliday, etc.)
Subfamily **Euphorinae** Cresson.
(*Euphorus* Nees, etc.)
Subfamily **Braconinae** Gahan=(Agathinae Cresson) (part).
(*Bracon* Jurine, etc.)
Subfamily **Bassinae,** new subfamily=(Microdini Ashmead).
(*Bassus* Fabricius, etc.)

Subfamily **Sigalphinae,** new subfamily=(Cheloninae Cresson).
(*Sigalphus* Latreille, etc.)
Subfamily **Triaspinae,** new subfamily=(Sigalphinae Cresson).
(*Triaspis* Haliday, etc.)
Subfamily **Rhyssalinae** Cresson (part).
(*Rhyssalus* Haliday, etc.)
Subfamily **Exothecinae,** new subfamily.
(*Exothecus* Wesmael, etc.)
Subfamily **Pelecystominae,** new subfamily=(Rhogadides Marshall).
(*Pelecystoma* Wesmael, etc.)
Subfamily **Doryctinae,** new subfamily.
(*Doryctes* Haliday, etc.)
Subfamily **Hecabolinae,** new subfamily.
(*Hecabolus* Haliday, etc.)
Subfamily **Spathiinae** Cresson (part).
(*Spathius* Nees, etc.)
Subfamily **Stephaniscinae** Enderlein.
(*Stephaniscus* Kieffer, etc.)
Subfamily **Pambolinae,** new subfamily.
(*Pambolus* Haliday, etc.)
Subfamily **Hormiinae,** new subfamily.
(*Hormius* Nees, etc.)

Family **Myersiidae** Viereck.
(*Myersia* Viereck, etc.)

Family **Evaniidae** Westwood.
Subfamily **Evaniinae** Ashmead.
(*Evania* Fabricius, etc.)
Subfamily **Gasteruptioninae** Ashmead.
(*Gasteruption* Latreille, etc.)
Subfamily **Aulacinae** Ashmead.
(*Aulacus* Jurine, etc.)

Family **Eupachylommidae** Viereck.
(*Eupachylomma* Ashmead.)

Family **Ropronidae** Viereck.
(*Propronia* Provancher.)

Family **Trigonalidae** Cresson.
(*Trigonalys* Westwood, etc.)

Family **Ichneumonidae** Haliday.
Subfamily **Aphidiinae** Cresson.
(*Asphidius* Nees, etc.)*
Subfamily **Campopleginae,** new subfamily = (Limnerinae Szepligeti).
(*Campoplex* Gravenhorst, etc.)

* The Aphidiini and Trioxini are in the writer's opinion too closely related to be entitled to rank as groups of genera.

Subfamily **Charopsinae**, new subfamily.
(*Charops* Holmgren, etc.)
Subfamily **Cryptophioninae,** new subfamily.
(*Cryptophion* Viereck.)
Subfamily **Exetastinae,** new subfamily.
(*Exetastes* Gravenhorst, etc.)
Subfamily **Pristomerinae,** new subfamily.
(*Pristomerus* Curtis, etc.)
Subfamily **Porizoninae,** new subfamily = (Porizontinae Szepligeti).
(*Porizon* Fallen, etc.)
Subfamily **Plectiscinae** Szepligeti.
(*Plectiscus* Gravenhorst, etc.)
Subfamily **Adelognathinae** Szepligeti.
(*Adelognathus* Holmgren, etc.)
Subfamily **Cremastinae** Szepligeti.
(*Cremastus* Gravenhorst, etc.)
Subfamily **Mesochorinae** Szepligeti.
(*Mesochorus* Gravenhorst, etc.)
Subfamjly **Nesomesochorinae,** new subfamily=(Neomesochorinae Szepligeti).
(*Nesomesochorus* Ashmead, etc.)
Subfamily **Megacerinae** Szepligeti.
(*Megaceria* Szepligeti.)
Subfamily **Paniscinae** Szepligeti.
(*Paniscus* Schrank, etc.)
Subfamily **Therioninae,** new subfamily = (Anomalinae Szepligeti).
(*Therion* Curtis, etc.)
Subfamily **Eiphosominae,** new subfamily = (Xiphosominae Szepligeti).
(*Eiphosoma* Cresson, etc.)
Subfamily **Hymenopharsalinae,** new subfamily=(Pharsaliinae Szepligeti).
Subfamily **Anomaloninae,** new subfamily = (Nototrachinae Szepligeti).
(*Anomalon* Panzer.)
Subfamily **Ophioninae** Cresson (part).
(*Ophion* Fabricius, etc.)
Subfamily **Hellwiginae,** new subfamily.
(*Hellwigia* Gravenhorst, etc.)
Subfamily **Metopiinae,** new subfamily=(Tryphoninae Cresson).
(*Metopius* Panser, etc.)
Subfamily **Catoglyptinae,** new subfamily = (Mesoleptini Ashmead).
(*Catoglyptus* (Foerster), etc.)

Subfamily **Cteniscinae,** new subfamily.
(*Cteniscus* Haliday, etc.)
Subfamily **Ctenopelminae,** new subfamily.
(*Ctenopelma* Holmgren, etc.)
Subfamily **Tryphoninae** Cresson (in part).
(*Tryphon* (Fallen), etc.)
Subfamily **Orthocentrinae,** new subfamily.
(*Orthocentrus* Gravenhorst, etc.)
Subfamily **Exochinae,** new subfamily.
(*Exochus* Gravenhorst, etc.)
Subfamily **Tylocomninae,** new subfamily = (Trachydermatini Ashmead).
(*Tylocomnus* Holmgren, etc.)
Subfamily **Sphinctinae,** new subfamily.
(*Sphinctus* Gravenhorst.)
Subfamily **Ichneumoninae,** new subfamily = (Pimplinae Cresson).
(*Ichneumon* Linnaeus, etc.)
Subfamily **Lissonotinae,** new subfamily.
(*Lissonota* Gravenhorst, etc.)
Subfamily **Labeninae,** new subfamily.
(*Labena* Cresson, etc.)
Subfamily **Acoenitinae,** new subfamily.
(*Accoenites* Latreille, etc.)
Subfamily **Xoridinae**, new subfamily.
(*Xorides* Latreille, etc.).
Subfamily **Gelinae,** new subfamily=(Cryptinae Cresson, part). =Pezomachini Ashm.
(*Gelis* Thunberg, etc.)
Subfamily **Stilpninae,** new subfamily.
(*Stilpnus* Gravenhorst, etc.)
Subfamily **Phygadeuoninae,** new subfamily.
(*Phygadeuon* Gravenhorst, etc.)
Subfamily **Hemitelinae**, new subfamily.
(*Hemiteles* Gravenhorst, etc.)
Subfamily **Hemigasterinae,** new subfamily.
(*Hemigaster* Brullé, etc.)
Subfamily **Osprynchotinae,** new subfamily = (Cryptini Ashmead).
(*Osprynchotus* Spinola, etc.)
Subfamily **Mesosteninae,** new subfamily.
(*Mesostenus* Gravenhorst, etc.)
Subfamily **Joppocryptinae,** new subfamily.
(*Joppocryptus* Viereck.)
Subfamily **Joppinae,** new subfamily=(Ichneumoninae Ashmead, in part.)
(*Joppa* Fabricius, etc.)

Subfamily **Phaeogeninae,** new subfamily.
(*Phaeogenes* Wesmael, etc.)
Subfamily **Alomyinae,** new subfamily.
(*Alomya* Panzer.)
Subfamily **Heresiarchinae,** new subfamily.
(*Heresiarches* Wesmael, etc.)
Subfamily **Listrodrominae,** new subfamily.
(*Listrodromus* Wesmael, etc.)
Subfamily **Ambytelinae,** new subfamily=(Ichneumonini Ashmead).
(*Amblyteles* Wesmael, etc.)

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NEW PLANTS OF THE PACIFIC NORTHWEST.

BY CHARLES V. PIPER.

The activities of field botanists in the Pacific Northwest continue to reveal interesting additions to the recorded flora. The species here described are among the most noteworthy. Especially interesting are the new species of *Vaccinium* and *Mertensia*. The types are in the possession of the writer.

Epilobium cinerascens, n. sp.

Perennial, erect, 60–120 cm. high, covered throughout with fine whitish spreading rather dense pubescence, not at all glandular; leaves sessile, lanceolate, acute, broadest at base, prominently denticulate, the larger 3–7 cm. long; flowers purple, 7–9 mm. long; pedicels and ovoid buds erect; calyx-lobes lanceolate, acute, 4 mm. long; petals obcordate; stigma clavate; pods 3–4 cm. long and pedicels 1 cm. long; seeds three times as long as broad, about 1 mm. long, .3 mm. broad, minutely tuberculate, not at all hyaline; coma white.

Specimens have been examined as follows:

Washington: Spokane, *Piper* No. 2269; Lake Kalispel, *Kreager* July 30, 1902; Bingen, *Suksdorf* Nos. 2748, 2749.

Oregon: Milwaukee, *Piper* No. 5049; Sutherlin, Douglas County, *Peck* No. 7817 (type).

This species is intermediate between *E. franciscanum* Barbey and *E. holosericeum* Trelease. It differs from *E. franciscanum*, to which it has been referred, in its dense fine pubescence, sessile leaves and more slender seeds. *E. franciscanum* seems to be purely a seacoast species and has been collected as far north as Seal Rock near Newport, Oregon, *Peck* No. 4398.

Vaccinium coccineum, n. sp.

Shrub 1–1.5 m. high, the branchlets slightly angled; leaves thin-membranaceous, bright green on both sides, translucent, loosely reticulate-veined, mostly obovate, acute or acutish, 2–3 cm. long, short-petioled, closely serrulate, glabrous except for minute puberulence on the veins

above, sparse delicate glandular hairs on the veins beneath and a similar hair tipping each serration; calyx limb obscurely lobed; berries solitary, depressed-globose, smooth, bright red, 6–8 mm. in diameter, the pedicels stout, somewhat clavate, about 5 mm. long; seeds smooth, somewhat trigonous.

Steve Peak, Josephine County, Oregon, on sandy slopes and ridges 5,200 feet altitude, August 24, 1917, *M. W. Gorman* No. 4180. "Fruit red of excellent flavor both raw and cooked." This interesting species apparently bears a similar relation to *V. macrophyllum* (Hook.) Piper [*V. membranaceum* Dougl.] as does *V. parvifolium* Smith to *V. ovalifolium* Smith.

Mertensia bella, n. sp.

Perennial, tuberous; stems very slender, glabrous below, very sparsely appressed pubescent above, simple below the inflorescence, 40 cm. high, solitary (?) from a dark globose tuber about 2 cm. in diameter; leaves ovate or the upper lance-ovate, acute, green, very thin, minutely appressed-hispidulous above, glabrous beneath, the blade 2.5–3.5 cm. long, all with petioles, those of the lower leaves 1–2 cm. long; peduncles 6–10 cm. long, one in each upper axil; flowers in cymes, often subumbellate, some solitary in the forks of the branches; pedicels slender, appressed-hispidulous, 6–10 mm. long, some at least pendent in fruit; calyx-lobes oblong-lanceolate, acute, appressed puberulent, 2–3 mm. long; corolla blue, open campanulate, 5–6 mm. long, the acutish lobes about one-third as long as the tube; stamens half as long as the corolla, the slender filaments as long as the anthers; style included, half as long as the corolla; nutlets whitish, rugose.

Horse Pasture Mountain, 10 miles southwest of McKenzie Bridge, Lane County, Oregon, July 2, 1914, *M. E. Peck* No. 5811.

A remarkably distinct species not closely related to any other described and constituting a new section to the genus.

Castilleja indecora, n. sp.

Perennial apparently from rootstocks; stems slender, erect or usually decumbent at base, sparsely pilose, 10–15 cm. high; leaves all entire, lanceolate, sessile, broadest at base, attenuate-acuminate, sparsely pubescent on both sides, 2–3 cm. long; bracts broader, mostly yellowish at tip, each with a pair of narrow linear lobes; spikes dense, 2–5 cm. long, yellowish; calyx pilose, 12–16 mm. long, more deeply cleft before than behind, the two lobes shallowly emarginate at tip; corolla yellowish, minutely puberulent, at length 2 cm. long; galea 5–6 mm. long, straight except the slightly hooked apiculate tip; barely extruded; lip about 2 mm. long, the teeth somewhat fleshy, oblong-ovate, acutish; anthers sparsely pilose; stigma capitate, entire, extruded; capsule brown, ellipsoidal, apiculate; seeds with loose cellular reticulated coat.

Wallowa Mts., Wallowa County, Oregon, 8,000 feet altitude, 10 miles north of Cornucopia, September 8, 1915, *M. E. Peck* No. 4282.

Grindelia andersonii, n. sp.

Perennial, glabrous except for a very sparse pubescence especially in the inflorescence, gummy only on the heads; stems erect, 30–50 cm. high; basal leaves not seen but described as "growing in close rosette out of which the flowering stems arise"; cauline leaves numerous especially toward the top, alternate or a few opposite, linear to narrowly spatulate, entire, acute, attenuate to the base, 4–10 cm. long; heads solitary or several in a loose cyme, all peduncled, each 1.5–2 cm. broad; tegules in several series, somewhat gummy, lanceolate, broadest at base, attenuate acuminate, the outermost linear and foliaceous; rays about 30, deep yellow, 15–20 mm. long; pappus bristles two, corneous, whitish, minutely serrulate, straight or curved, shorter than the florets.

Saanich Arm, Vancouver Island, July 5, 1917, *J. R. Anderson*, "growing at the mouth of a stream with *Glaux maritima* on tidal flats submerged at high water."

A very remarkable species especially in its foliage. It might be considered an abnormal form if it did not occur in abundance where collected.

Hoorebekia (§Pyrrocoma) curvata, n. sp.

Underground parts not seen; stems slender, curved and apparently subdecumbent, sparsely pilose, 45 cm. long, simple to the inflorescence; leaves membranous, narrowly lanceolate, cuspidately acute, sparsely pilose on each surface, remotely ciliate with short stout hairs from a white indurated margin, the lower 10–15 cm. long narrowed at base and short petiolate, the cauline much shorter, sessile and gradually reduced upward; inflorescence thinly tomemtose of 7 to 12 long-peduncled heads; involucre broadly campanulate, 5–7 mm. high; tegules plane, broadly linear, cuspidate-acute, chartaceous except the green tips, sparsely pilose on the back and densely ciliate with white hairs, loosely imbricate in about three ranks; receptacle with about 6 concentric sets of subulate-triangular flat papillae; rays few, slender, 6–7 mm. long; tubular corollas 5 mm. long; pappus copious, sordid; akenes densely appressed pubescent, the terminal hairs longer and forming a dense circlet.

Klamath Falls, Oregon, *M. E. Peck* No. 7492, August 28, 1916. A peculiar species not closely related to any thus far described, but nearest *Aplopappus lanceolatus* (Hook.) Torr. & Gray.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW SPECIES OF FOSSIL MARINE SHELLS FROM CALIFORNIA.*

BY PAUL BARTSCH.

The two shells described below were found in a small collection of fossils collected by Mr. Thomas Oldroyd, at Nob Hill Cut, San Pedro, Cal., which was submitted to the author for critical examination.

At the request of the collector they are now described.

The types of the two species are at present in Mr. Oldroyd's collection.

Vitrinella thomasi, new species.

Shell lenticular, creamy white. Nuclear whorls two and a half, well rounded, smooth, scarcely showing incremental lines. Postnuclear whorls one and three-fourths, well rounded, with deeply impressed suture, marked by very fine, quite regular incremental lines only. Periphery strongly rounded. Base very broadly openly umbilicated, all the whorls being visible within the umbillicus. The basal portion of the whorls is strongly rounded and marked by incremental lines only. Aperture almost circular, slightly oblique; peristome complete, very slightly notched at the parietal wall.

The type measures: greater diameter, 1.8 mm.; altitude, .8 mm. This species suggests *Vitrinella williamsoni* Dall, but the latter is much larger and decidedly more depressed. The whorls are much broader than high, and the aperture therefore is more oval in that species.

Aesopus idae, new species.

Shell very elongate conic, increasing regularly in size. Nuclear whorls decollated. Postnuclear whorls rather high between the sutures, narrowly tabulatedly shouldered at the summit, marked by rather irregular retractively slanting lines of growth, which in the type are rather accentuated, owing to the weathering of the specimen. In the type there are

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indications of sculpture on the spire, but the specimen is too worn to make sure of this. Base protracted, the anterior portion marked by the continuation of strong lines of growth and indications of strong spiral lirations. Aperture oval, decidedly channeled anteriorly, posterior angle acute; outer lip rather thick; inner lip sigmoid, reflected over and appressed to the base; parietal wall covered by a thick callus.

The type has seven whorls remaining (the extreme tip being lost) and measures: length, 12.5 mm.; diameter, 4.5 mm. This specimen is the largest *Aesopus* so far known from the West Coast of America.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW FOSSIL PYRAMIDELLID MOLLUSK FROM THE WEST COAST OF AMERICA.

BY PAUL BARTSCH.*

Turbonilla (Pyrgolampros) amava, new species.

Shell elongate conic. Nuclear whorls decollated. Postnuclear whorls flattened, slightly excurved at the narrowly shouldered summit, marked by decidedly obsolete axial ribs, which are too feeble to permit counting and numerous closely spaced spiral striations. The summit of the succeeding turns falls very slightly anterior to the somewhat angulated periphery, and gives the whorls an overhanging appearance. Suture strongly impressed. Periphery of the last whorl feebly angulated. Base short, well rounded, marked by fine incremental lines and exceedingly fine spiral striations only. Aperture rhomboidal; posterior angle obtuse; outer lip thin; inner lip slightly curved, revolute, appressed to the base only at the expanded portion of its insertion, the rest free; parietal wall covered by a thin callus.

The type; Cat. No. 325612, U. S. N. M., comes from the lower San Pedro series of Dead Man's Island, California. It has lost the nucleus, and probably the first postnuclear turns. The nine and a quarter turns remaining measure: length, 6.4 mm.; diameter, 1.9 mm.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

BIOL

DESCRIPTION OF A NEW SUBSPECIES OF THE LITTLE YELLOW BITTERN FROM THE PHILIPPINE ISLANDS.

BY ALEXANDER WETMORE.

While examining and comparing skins of *Ixobrychus sinensis* collected in Polynesia, with specimens taken elsewhere it became evident that birds from the Philippine Islands differ constantly in certain characters from those from other regions. In spite of the fact that a number of names have been given to these bitterns from various parts of their extensive range, there seems to be none available for the form under discussion. The birds found in the Philippine Islands therefore may be known as

Ixobrychus sinensis astrologus, subsp. nov.

Characters.—Similar to *Ixobrychus sinensis bryani* (Seale) from Guam but smaller, bill in adult more slender, back darker, more brownish, under tail coverts somewhat more buffy, upper breast and foreneck slightly paler, back of neck slightly paler, more reddish.

Description.—Type, No. 254201, U. S. National Museum, male adult, from Paete, Laguna, Luzon, Philippine Islands; collected July 26, 1915, by R. C. McGregor and A. Celestino. Forehead slate-gray shading at once into dusky neutral gray on crown, this neutral gray extending over the slightly elongated crest; back of neck pecan brown, this color passing down to shoulders; back and scapulars snuff brown, the feathers of the upper back tipped with olive-brown, the snuff brown of the back shading into fuscous on the rump; upper tail coverts black, lightly glossed with faintly iridescent greenish; tertials dull sayal brown faintly edged with hair brown; greater and middle wing coverts tawny-olive, broadly margined with pinkish buff; lesser wing coverts slightly paler than tawny-olive; shoulder pecan brown; exposed upper surfaces of primaries, secondaries, feathers of alula and rectrices dusky neutral gray; outer edge of outer primary very narrowly margined with cream color; median portion of outer web of outer feathers on alula broadly margined with cream color, becoming white toward the base; anterior margin of wing, under

wing coverts and axillars white, faintly washed with pinkish buff at bend of wing; throat white, washed in center with cinnamon-buff; superciliary stripe, sides of head and neck dull mikado brown, this color merging into cinnamon-buff on foreneck, the feathers of sides of neck tipped slightly with pinkish buff; foreneck and upper breast washed with cinnamon-buff, the feathers white basally; sides and flanks cinnamon-buff; lower breast, abdomen and under tail coverts washed with pinkish buff, the bases of the feathers broadly white; outer side of tibia cinnamon-buff, inner side pinkish buff; an area on either side of upper breast with centers of feathers dusky neutral gray, broadly margined with cinnamon-buff, the whole nearly concealed by the elongate feathers extending down from the base of the foreneck; base of culmen dull brown, distal two-thirds blackish; rest of bill light brown, darker towards tip; tarsus, toes and nails dark dull brown (from dried skin).

Measurements (in millimeters.—Males (4 specimens) wing 119.5–127.5 (123.9), tail 34.5–42 (38.6), exposed culmen 50–55 (51.4), tarsus 43–46 (44.5).

Females (2 specimens), wing 123.5–124 (123.7), tail 39.5, exposed culmen 53–55 (54), tarsus 44–45 (44.5).

Range.—Specimens examined from Laguna (Paete), Cavite, Ilocos Norte (Panay Lake), Luzon; and Panay, Philippine Islands.

Remarks.—In coloration this new form comes nearer to *Ixobrychus sinensis bryani* (Seale) from Guam than to any of the other forms of the Little Yellow Bittern at present known. From *Ixobrychus s. sinensis* from China the present subspecies differs in being darker, more rufescent above, more buffy, less whitish below, and in having the wing coverts much more buffy in color. It needs no comparison with the race occurring in the islands of Japan as that form is distinct from all of the other subspecies of *sinensis* in its large size and dark coloration. Three adult males of *I. s. astrologus*, in addition to the characters outlined in the diagnosis above, differ from adult males of *bryani* in having the greater and middle wing coverts grayer and less buffy. In another adult specimen examined (Cat. No. 77002), which is marked as coming from the Philippines without more certain locality, these wing coverts are similar in color to those in the birds from Guam.

I am greatly indebted to Mr. R. C. McGregor of the Bureau of Science in Manila, Philippine Islands, for adult skins of the Philippine form of the Little Yellow Bittern, and for the loan of one specimen in the collections under his charge, from the island of Guam. Without these a satisfactory diagnosis of the bird from the Philippine Islands would not have been possible.

Though the bitterns when under the observation of man are noted for their pose as star-gazers, it seems that this subterfuge is merely the pretense of a sciolist; wherefore it is more fitting to name this present bird ἀστρολόγος as the exponent of a false science, rather than ἀστρονόμος, the proper title for a more sincere student of the stars.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE DIMORPHS OF SPECIES OF CHAITOPHORUS.

BY A. C. BAKER.

The species of *Chaitophorus* feeding on maples produce in most species dimorphic forms in summer. These are small pale green flattened forms armed about the margin with hairs or leaf like structures. All the species which the writer has studied with the exception of *C. lyropecta* Kess. produce these forms. These species are as follows: *C. aceris* Linn., *C. americanus* Baker, *C. japonicus* Baker, *C. negundinis* Thos., and *C. testudinatus* Thornton. There has existed some little confusion in regard to the different species possessing these forms. American species have been determined as European ones and the European workers themselves have not been agreed in regard to the different forms. As far as the writer's observations extend, neither of the European forms, *aceris* and *testudinatus* occur in this country, but the species distinguished as undescribed have often been referred to by these names. While the other forms of the species are often quite difficult to distinguish the dimorphs give a ready means of separating the species with ease, as the following key will show. This key does not include *laricae* Haliday, which is unknown to the writer.

KEY TO DIMORPHS.

1. Armed with long stout hairs . . . . . *aceris* Linn.
   Armed with lamellae 2
2. Antennae nearly as long as the body; base of distal segment about one-quarter as long as unguis . . . . . *americanus* Baker
   Antennae considerably shorter than body; base of distal segment one-third to as long as unguis 3
3. Base of distal segment one-third to one-half as long as unguis *negundinis* Thos.

Base of distal segment fully as long as unguis 4
4. Dorsum with five rows of plate like structures . . *testudinatus* Thorn.
Dorsum with three rows of plate like structures . . *japonicus* Baker.

Chaitophorus aceris (Linn.).

The dimorph of this species is easily separated from that of other species by the long prominent hairs with which this species is armed. These are found in a row about the margin, consisting of about 28 hairs and in two median rows on the dorsum of about 8 hairs each. The antennae are armed with one or two long hairs. Average measurements are as follows: Antennal segment I, 0.032 mm.; Segment II, 0.032 mm., little more than half as thick as Segment I. Segment III, 0.112 mm., armed with at least one long hair nearly as long as the Segment. Segment IV, (0.032 mm. + 0.112 mm.) Length of body hairs about 0.272 mm. Length from vertex to tip of cauda 0.672 mm. Described from specimens taken by Theo. Pergande at Stettin, Prussia, July 26, 1898. It should be noted that in some of the literature dealing with dimorphic forms the lamellate dimorph of *testudinatus* is described under *aceris*.

Chaitophorus americanus Baker.

This species was described by the author from material collected by Dr. Edith M. Patch at Orono, Maine, June 15, 1909, on *Acer dasycarpum*. It can be distinguished from other lamellate species by the very long antennae and the length of the unguis of the distal segment. About the margin of the thorax and abdomen there are about twenty-four lamellae. Those on the lateral margin of the abdomen are rather broad, whereas those upon the thorax are narrow and those upon the caudal extremity are also. The first antennal segment is armed with a large protuberance nearly as long as the segment is thick. This extends forward toward the vertex. Average measurements are as follows: Segment I, 0.032 mm.; II, 0.02 mm.; III, 0.144 mm.; IV (0.048 mm. + 0.192 mm.). Largest lamellae about 0.064 mm. long. Length from vertex to tip of cauda, 0.592 mm.

Chaitophorus japonicus, n. sp.

Specimens of this species were received from Francis Windle, West Chester, Pa., through the Federal Horticultural Board. They were collected on May 19th, 1916, from a Japanese maple. At first it was thought that these were specimens of *testudinatus*, but a careful examination showed that the dorsal sculpturing is entirely different. In this species there is a central longitudinal row of plates and on each side of this a row of wide, short plates which extend from the median row to the margin, making in all three longitudinal rows, as compared to the five rows met with in *testudinatus*. The margin is armed with about 20 lamellae on the abdomen and thorax and these are broadly rounded. Those on the vertex are similar in shape. The first antennal segment lacks the large projection met with in *americanus*. Average measurements are as fol-

lows: Antennal Segment I, 0.032 mm.; II, 0.02 mm.; much thinner than I; III, 0.112 mm.; IV (0.048 mm. + 0.048 mm.); length of the lamellae about 0.064 mm. Length from vertex to tip of cauda, 0.528 mm. Color pale green with dark brown eyes. Type in U. S. National Museum.

Chaitophorus negundinis Thos.

This species is intermediate in structure between *americanus* and *japonicus*. It can be separated from either of these by the relative lengths of the antennal segments. It lives upon the boxelder and occurs commonly, sometimes quite abundantly and in destructive numbers in different parts of the United States and Canada. The dimorphs appear in large numbers during late summer. There are about 22 lamellae around the margins of the abdomen and these are slightly pointed as compared to those met with in some of the other species. Average measurements are as follows: Antennal segment I, 0.032 mm.; II, 0.032 mm.; III, 0.08 mm.; IV (0.04 + 0.112 mm.). Length from vertex to tip of cauda, 0.576 mm.

Chaitophorus testudinatus (Thornton).

This species can be separated by the distinct sculpturing of the dorsum which makes an arrangement of five rows of longitudinal plates. The lamellae are broad and rounded, in this way resembling those of *japonicus*.

Average measurements are as follows: Antennal Segment I, 0.032 mm.; II, 0.032 mm.; III, 0.128 mm.; IV (0.064 + 0.08 mm.). Length of lamellae, 0.58 mm.; length from vertex to tip of cauda, 0.64 mm. Described from specimens taken at Stettin, Prussia, July 26, 1898, by Theo. Pergande.

Chaitophorus laricae (Haliday).

The writer knows nothing of this species. It is figured by Signoret (Bull. Soc. Ent. France, Vol. VIII, IV Series XI). The fact that it was described from larch, whereas all of the other forms live upon maple, casts some doubt around the species and would make its rediscovery of much interest.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW SNAPPING TURTLE AND A NEW LIZARD FROM FLORIDA.

BY LEONHARD STEJNEGER.

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Mr. Nelson R. Wood, the well-known bird taxidermist of the U. S. National Museum, has collected a number of interesting reptiles from time to time on and near his farm at Auburndale, Polk County, Florida. On account of the freshness of the material which was received either alive or quite recently preserved, it has been possible to recognize distinctions from previously described forms, which were not obvious in the older specimens from Florida in the collection of the Museum.

Chelydra osceola, sp. nov.

Diagnosis.—Similar to *Chelydra serpentina*, but central laminæ of carapace relatively much wider, width of third central being one-third the length of the five centrals together, or more; knobs of dorsal keels located nearer center of laminæ; four small chin barbels.

Range.—Pinellas, Osceola, Brevard and Polk Counties, Florida.

Type.—U. S. National Museum, No. 10369; Clearwater, Pinellas County, Florida, September, 1879; S. T. Walker, collector.

Remarks.—Seven Florida specimens of different sizes (length of carapace from 123 to 305 mm.) are easily differentiated from typical *Chelydra serpentina*, as represented in the National Museum by a large series of specimens from all over its range on the mainland of North America, by the characters mentioned in the diagnosis. Of these the first one, viz., the excessive width of the central laminæ may be the persistence of a juvenile character and may therefore be less perceptible in young specimens. The more anterior location of the dorsal keel knobs which is so noticeable on all the laminæ, but more particularly on the fifth central, on which the knob rises nearly in the middle, is not a juvenile character, however, for in all the mainland specimens examined by me, the oldest

as well as the youngest, the knob is placed very close to the posterior seam, and age appears to make no difference.

In all the Florida specimens I find two pairs of chin barbels. In most mainland specimens from the United States only the anterior pair is developed, though in some there are indications of a posterior pair.

The caudal crests of compressed tubercles appear also to be diagnostic of the two forms, in as much as the tubercles of the median series are smaller and those of the lateral series larger as compared with the corresponding series in *Chelydra serpentina*, in which the contrast between the two series is thus much greater.

In the series before me there are indications of several equally important distinctive characters, but they must await confirmation by the accumulation of a more extensive material.

The dimensions in millimeters, of the type specimen, which is a male, are as follows: Total length of carapace, 231; width of carapace, 187; depth of body, 98; length of plastron, 157; width of head, 57; width of bridge, 13.

Sceloporus woodi, sp. nov.

Diagnosis.—Lateral scales directed obliquely upwards and backwards, and passing gradually into the dorsals; series of femoral pores widely separated, not meeting on the preanal region; tail cylindrical; head-shields smooth; distance between base of fifth toe and extremity of fourth greatly exceeding distance between end of snout and posterior border of ear, equalling that between nostril and arm; about 42 keeled and mucronate scales between interparietal shield and base of tail, about 11 corresponding to length of shielded part of head; 15–20 femoral pores; size small.

Range.—Central and East Central Florida.

Type.—United States National Museum, No. 48720; Auburndale, Polk County, Florida; Nelson R. Wood, collector.

Description.—Type: Adult male. Head-shields smooth; two canthal scales between the posterior of which three larger prefrontal shields across the snout; frontal shield divided transversely; posterior frontal in contact with interparietal; interparietal very large, as broad as long; parietals small, roughly equilaterally triangular; six transverse supraorbitals, first and sixth smallest, third much larger than the others; large supraoculars separated from frontals and anterior fronto-parietals by a semicircular series of small scales, which is slightly interrupted at the third and fourth (abnormally in this individual), and from superciliaries anteriorly by a double row and posteriorly by a single row of small scales; six supralabials, first and fifth separated from nasal and long subocular respectively by a single scale; fifth supralabial under center of eye; anterior border of ear-opening protected by three projecting, pointed scales, the two upper ones quite large; dorsal scales larger than ventrals, sharply keeled and mucronate, with a distinct notch on each side of point, in parallel series; about 42 scales along middle line of back from shielded part of head to base of tail; 12 scales in middle of back corresponding to

shielded part of head; lateral scales directed upwards and backwards, slightly smaller than dorsals; ventral scales smooth, notched behind; scales on throat and foreneck slightly smaller than ventrals, those on side of latter mucronate and notched; adpressed hind limb reaches center of eye; tibia equals shielded part of head; distance between base of fifth toe and extremity of fourth, without claw, nearly equals distance between nostril and arm; 17–18 femoral pores; caudal scales not much larger than dorsals; two enlarged postanal scales.

Color (in alcohol) above olive gray, slightly paler towards the sides, with two series of oblique, nearly linear, blackish spots equidistant from each other and from a strongly defined, broad, seal-brown lateral band which extends from middle of neck to base of tail; on top and sides of head some indistinct, narrow blackish lines; on sides of body below the dark band an indistinct pale band, below which an equally indistinct dusky band between axilla and groin; underside of body pale greenish white, on each side with a black-edged cobalt-blue patch; throat and foreneck black with a narrow whitish line down the middle, and a cobalt-blue patch on each side.

Dimensions.—Total length, 108 mm,; tip of snout to vent, 43 mm.; tip of snout to ear, 11 mm.; shielded part of head, 11 mm.; fourth toe, without claw, from base of fifth, 15 mm.; nostril to arm, 15.5 mm.; tibia, 11 mm.

Variation.—As usual in this genus, there is considerable variation in the head-shields. In some specimens the frontal is undivided and in others the anterior fronto-parietals are fused, thus separating frontal from interparietal. The type is apparently abnormal in having the large third supraocular in contact with the anterior fronto-parietal, as the semicircular series of scales in the other specimens is uninterrupted.

The full-grown female appears to be somewhat larger and stouter than the male, though the relative length of the fourth toe remains the same. Thus in an adult female from Georgiana, Fla., U. S. Nat. Mus. No. 11997, measuring 55 mm. from snout to vent, the length from snout to ear is 12, and from base of fifth toe to tip of fourth toe, without claw, 19 mm.

The coloration varies to some extent but not excessively so. The lateral stripes are often more conspicuous and better defined than in the type. The dorsal spots may be entirely absent, but in females and young they are often better developed and in the latter showing the regular pattern of blackish, interrupted and more or less zigzaggy cross-bars bordered with whitish behind. In the female and young the blue throat patches are present. In most of the adult males the median white line on the throat is broader and more conspicuous than in the type; in others it is entirely obliterated.

Remarks.—The above diagnosis, as will be noticed, if applied to Boulenger's synopsis of the species (Proc. Zool. Soc. London, 1897, p. 475) leads directly to his *Sceloporus serrifer* (Cat. Liz. Brit. Mus., vol. 2, 1885, p. 221). I say purposely "his" *S. serrifer*, because the characters given,

derived from a single specimen in British Museum, do not refer to Cope's species *Sceloporus serrifer* (Proc. Acad. Nat. Sci., Philadelphia, 1866, p. 124) the type of which, U. S. Nat. Mus. No. 24868, collected in Yucatan by A. Schott, is now before me. This latter is a large, stout lizard with short fourth toe belonging to the *S. torquatus* group as defined by Boulenger, and is consequently very different from the British Museum specimen. Moreover, it has the fourth supraocular in contact with the parietal shield, like *S. melanorhinus*, with the description of which it agrees in most respects, except that it has only 9–10 femoral pores as against 19–21 in the latter. Further details of the type of *S. serrifer* may be recorded as follows: Length from snout to vent, 98 mm.; length of shielded part of head, 20 mm.; length from snout to ear-opening, 23 mm.; length of tibia, 21 mm.; fourth toe, without claw, from base of fifth, 23 mm.; number of scales from occiput to base of tail, 26; dorsal scales corresponding to length of shielded part of head, 5; scales around middle of body, 34. The specimen in British Museum, collected by Sallé in Mexico, from which Boulenger derived the characters in the synopsis and which he described in considerable detail in his Catalogue (l. cc.) is quite a distinct species, as correctly suspected by him, characterized by an exceedingly long hind toe like *S. woodi*. As Dr. A. Guenther was the first to express doubts about its being identical with *S. serrifer* of Cope it may be properly known as *Sceloporus guentheri*.

The Florida species here described has nothing to do with either of the above species being one of the smallest of the genus, although it shares with *S. guentheri* the excessively lengthened fourth toe, a character apparently unique among the North American species.

There are, consequently, three distinct species in Florida, viz., *Sceloporus spinosus floridanus* (Baird) which occurs in the extreme northwestern part of the State; *Sceloporus undulatus* (Latreille) of which the National Museum has specimens from northern, north-central and western counties as far south as Pinellas County; and *Sceloporus woodi*, the species here described from Polk County. The National Museum has also a good series from Georgiana, Brevard County, collected many years ago by Mr. William Wittfield.

I have named this interesting novelty for Mr. Nelson R. Wood in recognition of his valuable contributions to the herpetological collections of the National Museum.

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PROCEEDINGS

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BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

THE EARLIEST TECHNICAL NAME FOR THE PORTUGUESE IBEX

Recent authors have cited the name *Capra lusitanica* from França, 1909 (Bull. Soc. Portugaise Sci. Nat., vol. 2, p. 144), based on the description of the "Cabra-Montez da Serra do Gerez" of Bocage, 1857 (Mem. Acad. Sci. Lisboa, ser. 2, vol. 2, pt. 1, p. 1, pls. 1, 2). It is worthy of record that the Portuguese Ibex was given a valid technical name in 1872, thirty-seven years earlier than the generally accepted date. The correct reference is *Capra lusitanica* Schlegel, De Dierentuin van het Koninklijk Zoölogisch Genootschap Natura Artis Magistra te Amsterdam, Zoogdieren, p. 96, 1872. The animal there described as differing from *Capra pyrenaica* is the ibex of the mountains of southern Spain and of Portugal; a composite of the modern *Capra pyrenaica lusitanica* França, *C. p. victoriæ* Cabrera, and *C. p. hispanica* Schimper. The name may now be restricted to the ibex of Serra do Gerez, northern Portugal—the same form recently named *Capra lusitanica* by França; especially as Schlegel in an earlier paper (Jaarboekje Koninklijk Zoologisch Genootschap Natura Artis Magistra, 1857, p. 161), where the name is a *nomen nudum*, says that it has been applied to the Portuguese ibex ("Men heeft intusschen aan voorwerpen, uit Portugal afkomstig, den naam van *Capra lusitanica* gegeven"). This suggests a still earlier publication of the name which I have been unable to find. —*N. Hollister.*

THE YELLOW RAIL IN THE DISTRICT OF COLUMBIA.

When Prof. W. W. Cooke prepared his list of birds of the District of Columbia, published in these Proceedings, vol. 21, pp. 107–118, April 11, 1908, he had only three records of the Yellow Rail (*Coturnicops noveboracensis*) in the District—one for 1879 and two for 1893. A fourth specimen should now be recorded. On May 20, 1917, Mrs. E. Caminetti sent to the National Zoological Park a live Yellow Rail just found in the yard at 307 C St. N. W., Washington, D. C. The bird, a female, was apparently in good condition but lived only four days. It was placed in the National Museum collection. —*N. Hollister.*

INSTINCTIVE FEEDING HABITS OF YOUNG HERONS.

During 1916 I noticed an interesting phenomenon exhibited by certain young herons during feeding. Mr. Alfred Worm of Manila, Philippine Islands, had, in his possession, two young herons, only a few weeks old, belonging to the species *Pyrrherodias manillensis* (Meyen). These he was accustomed to feed on small, dried fish which were thrown to them on the floor of the verandah where they were kept. I was present on one occasion when the birds were being fed and noticed that they seemed to be unable to secure their food without considerable effort. The first thrust for each fish in turn invariably fell short of its mark, and it was only after several attempts that the object was secured. The birds seemed to profit by experience enough to vary their attempts until the morsel was obtained, yet as each new tidbit was thrown to them it was, like the others, first missed and then, after several attempts, captured.

The persistence of this first under-reaching suggested a possible clue and an experiment was made to test out the theory. A basin of water was obtained and placed on the floor of the verandah and into the water was thrown one of the dried fish. True to expectations one of the herons secured this at the first attempt. The experiment was repeated a number of times, and always the fish was picked up with one thrust of the bird's beak. Another fish, thrown on the bare floor, was missed as before.

The explanation of the matter seems to lie in the refraction of light rays passing from a denser to a less dense medium, as in this case, from water into air. By this refraction, the fish submerged under water would, to the herons looking down diagonally from above, appear to be somewhat more distant than they were in reality, and to reach them by a direct stroke, it would be necessary for the birds to aim their thrust at a point nearer than the apparent object. When the same 'correction' would be applied in the case of food not submerged, the result would, of course, be a miss.

Since perhaps the majority of food secured by herons is taken from under a few inches of water, it is quite conceivable that a habit which would lead them to make a correction for refraction would result in an increase in the food supply obtained and would tend to become instinctive. That the habit was instinctive in the two birds under consideration seems unquestionable since these were taken from the nest before they can have had any actual experience or instruction in the art of capturing submerged prey.

Whether or not birds of this group in a wild state and born with this instinct would eventually learn to discriminate between non-submerged and submerged objects and would acquire the ability to strike unerringly and with equal facility at desirable prey in either situation, is a question which I am at present unable to answer. It would be interesting to know whether or not the same habit is inherent in all young herons. It may prove to be not so much a habit as a phenomenon due to some special modification of the herons' organs of vision. —*John T. Zimmer.*

THE STATUS OF PEROGNATHUS LONGIMEMBRIS (COUES).

While identifying certain specimens in the Field Museum I have had occasion lately to refer to rather detailed memoranda made some years ago regarding a reexamination of the type specimen of *Perognathus longimembris*. This reexamination was induced by the acquisition of considerable material by the U. S. Biological Survey subsequent to the publication of a revision of the genus *Perognathus* in 1899 (North American Fauna No. 18). In this revision the immature and poorly preserved type was identified with the larger of the two species found in the vicinity of the type locality and previously known as *Perognathus inornatus*. A later and somewhat reluctant conclusion, not heretofore published, is that the type is an example not of the larger but of the smaller species, that is, the one currently known in a broad sense as *Perognathus panamintinus*. The case is one of considerable difficulty and final solution of all the points involved probably awaits careful field work fortified by previous study of all the specimens now in collections. In the hope that they may be of use to those having opportunity for such field work, therefore, these notes are published.

The type of *Otognosis longimembris*, now in the U. S. National Museum, is labeled as having been collected by John Xantus some fifty years ago at old Fort Tejon, Cañada de las Uvas, Kern County, California. This locality is situated in one of the passages leading through the Tejon or Tehachapi Mountains from the southern part of the San Joaquin Valley to the Mojave Desert. These mountains also connect the Sierras with the southern coast ranges. Hence, the site of Fort Tejon, long since abandoned as a military post, is within comparatively easy reach of several faunal districts. Recent collectors have failed to secure any pocket mice at the actual site of the old fort and it is, therefore, probable that the type did not come from there but from some of the surrounding country. There are two species inhabiting this surrounding country which as adults are easily distinguishable but which may be exceedingly similar when only partly mature. For convenience, these species may be referred to as the larger and the smaller, one having a range to the northward, principally in the San Joaquin Valley, and the other to the south and east, except as noted below.

Of the specimens which have been taken in the general Tejon region, the majority belong to the smaller species. In fact the larger species has been found in the region at but one locality, namely Rose Station, which is well within the San Joaquin Valley. Specimens from this locality are in the Biological Survey collection and in the Field Museum. This species has not been found farther south. On the other hand, specimens of the smaller species have been obtained at various places on all sides of the old fort. Thus there are examples of it in the Biological Survey collection from San Emigdio Canyon and Tejon Canyon and in the Field Museum from Lockwood Valley and Castac Lake, in all about a dozen specimens. Possibly still others are now in collections, but I am unable to bring them all together at present.

Geographical probabilities thus favor the supposition that the type was of the smaller species, but the matter is complicated by the discovery that certain specimens from the San Joaquin Valley are practically indistinguishable from the smaller species and suggest the possibility that both species occur throughout that region. These small specimens are found in relatively small numbers at localities where the large species has been taken in series. Out of nearly 200 specimens examined from the San Joaquin Valley only nine are small. These are as follows: Fresno 2; Lodi 3; Marysville Buttes 1; Oakdale 1; Three Rivers 2. Attempts to account for these small specimens on the basis of sexual or individual variation have not been thoroughly satisfactory. Moreover, it is practically impossible to distinguish them by cranial characters from specimens from the Tejon region. As compared with the larger species of the San Joaquin Valley (*inornatus*) they are characterized by smaller size, smaller mastoid bullae, narrower braincase, less mastoid width, slightly shorter nasals, less width across parieto-frontal suture, and always greater relative and usually greater actual width across the interorbital space. No single one of these characters is very pronounced but all are so constantly correlated that after careful study one finds it difficult to believe they are not of specific significance.

The type of *longimembris*, which was placed with the larger species on account of a rather narrow interorbital space, now seems clearly to belong to the smaller form. Its interorbital space, although actually narrow, is relatively about the same width as in other examples of the smaller species and it agrees with them in the other cranial characters above mentioned. The type is preserved in alcohol, the skull having been removed and cleaned in recent years. The skin is in poor condition and identification depends wholly upon the skull which is that of an immature animal. Among recent specimens, the one most closely resembling the type is an adult female collected in Tejon Canyon by Luther J. Goldman in July, 1903, and now in the Biological Survey collection. It has the crowns of the molars worn flat and, although much older than the type, agrees with it very closely.

It seems, therefore, that the name *Perognathus inornatus* should be revived for the larger species of the San Joaquin region, its one subspecies being *Perognathus inornatus neglectus*. The name *longimembris* should again be used for the small species of the Tejon region, *P. elibatus* and perhaps *P. brevinasus* being synonyms. Closely related subspecies are *P. l. panamintinus*, *P. l. bangsi*, and *P. l. arenicola*, while later study very probably will show that *P. nevadensis* and *P. pericalles* should be added to these. —*Wilfred H. Osgood.*

A NEW NAME FOR AN AFRICAN RAT.

The name *Rattus centralis* now in use for a rat described from Rhino Camp, Lado Enclave, is preoccupied by *Mus auricomis centralis* Schwann, Proc. Zool. Soc. London, 1906, vol. 1, p. 107, proposed for a South African form now standing as *Rattus namaquensis centralis*. The Lado rat (*Epimys kaiseri centralis* Heller, Smithsonian Misc. Coll., vol. 63, No. 7, p. 10, June 24, 1914) must have a new name and may be known as *Rattus* **helleri**. —*N. Hollister.*

OLOR COLUMBIANUS ON THE POTOMAC RIVER.

For many years *Olor columbianus* has not been at all common in winter on the Potomac River, but during the winters of 1915–1916 and 1916–1917 it resorted in considerable numbers to this river near Widewater, Virginia, some 40 miles below the city of Washington. It appeared first on January 17, 1916, and remained in varying numbers, usually from 200 to 300, until April 1, 1916. With the swans were numbers of Scaup Ducks (*Marila marila* and *Marila affinis*), Mallards (*Anas platyrhyncha*), Canvas-backs (*Aristonetta valisineria*), and some Red-heads (*Nyroca americana*). During the following winter the swans came on November 14, 1916, and stayed until March 29, 1917. During this period the usual number present was about 200, and accompanying them were mallards, canvas-backs, and red-heads in considerable numbers.

For much of the above data the writer is indebted to Miss Pickett Waller, of Widewater, Virginia. —*Harry C. Oberholser.*

SQUATAROLA SQUATAROLA CYNOSURAE NEAR WASHINGTON, D. C.

The only published record of the occurrence of the black-bellied plover in the District of Columbia is that of a single one seen by the writer on October 24, 1916, near the mouth of the Anacostia River, D. C. (Proc. Biol. Soc. Wash., XXX, July 27, 1917, p. 122). There are, however, in the Biological Survey collection three birds of this species in first autumn plumage collected on the Anacostia River, D. C., on September 26, 1914. These birds were found in the Washington Center Market by Dr. T. S. Palmer, and were overlooked when I made the statement that my record for October 24, 1916, was the first for the District of Columbia. These specimens now substantiate the record of the bird seen last year on the Anacostia River, and it seems therefore worth while to place them on permanent record. —*Harry C. Oberholser.*

HIEROFALCO RUSTICOLUS CANDICANS IN NORTH DAKOTA.

Through the courtesy of Mr. H. V. Williams, of Grafton, North Dakota, I am able to record the capture of a specimen of *Hierofalco rusticolus candicans* (Gmelin) in North Dakota. This bird was taken at Grafton, North Dakota, on October 7, 1908, and is preserved in Mr. Williams' collection. It is in the phase formerly known as *Hierfalco rusticolus gyrfalco*. It forms apparently the first record of the species for North Dakota. —*Harry C. Oberholser.*

ARISTONETTA, A GOOD GENUS.

The canvas-back duck, *Anas valisineria* Wilson, is commonly referred to the genus *Marila* Oken (type, *Marila marila*) or more properly to *Nyroca* Fleming (type, *Nyroca nyroca*), the latter being a group readily separable from *Marila*. A comparison of the canvas-back's structural characters, however, with those of the species composing the genera *Marila* and *Nyroca*, reveals at once that it is generically distinct. Its nearest ally is the European pochard *Nyroca ferina* (Linnaeus), but from this and from *Nyroca americana* it differs in the following respects: exposed culmen equal to the inner toe with claw; bill not wider near tip than at base, much flattened terminally, and with the tip of the maxilla very slightly or not at all hooked; greatest width of the bill only one-third of the length of exposed culmen; feathers on side of maxilla reaching as far forward as the feathers on the culmen; and nostril much elongated.

The generic name of this species is of course *Aristonetta* Baird (Rep. Expl. & Surv. R. R. Pac., IX, 1858, p. 793; type by original designation, *Anas valisineria* Wilson). Our canvas-back should, therefore, hereafter be known as *Aristonetta valisineria* (Wilson). —*Harry C. Oberholser.*

SPIZELLA MONTICOLA (GMELIN), THE CORRECT NAME FOR THE NORTH AMERICAN TREE SPARROW.

Messrs. Mathews and Iredale have recently proposed* to replace *Fringilla monticola* Gmelin† by *Fringilla canadensis* Boddaert,‡ and thus to call our North American tree sparrow *Spizella canadensis* (Boddaert). The fatal flaw in this proposition, to which Dr. Charles W. Richmond has called the writer's attention, is the misidentification of Boddaert's name. The *Fringilla canadensis* of Boddaert was based on d'Aubenton, Planch. Enlum., No. 223, Fig. 2; "Le Soulciet" of Buffon§; and Brisson's "Moineau de Canada."‖ A careful examination of d'Aubenton's plate and the descriptions of Buffon and Brisson above quoted leave no doubt at all that the bird figured and described is not *Spizella monticola* (Gmelin), but *Zonotrichia leucophrys* in juvenal plumage. The figure is poor and apparently resembles the juvenal plumage of *Zonotrichia gambeli*, but since the chances are so much against the probability that d'Aubenton had available a specimen of the western *Zonotrichia gambeli*, and particularly since Brisson in his description mentions a dark lore spot, it is much more credible that we have here a poor figure of *Zonotrichia leucophrys*, than of *Zonotrichia gambeli*. In any case the name *Fringilla canadensis* Boddaert can not be applied to *Spizella monticola* (Gmelin), and the latter must therefore still be called by its current name. —*Harry C. Oberholser.*

* Austral Avian Record, III, No. 2, November 19, 1915, p. 41.

† Syst. Nat., I, ii, 1789, p. 912 (Canada).

‡ Tabl. Planch. Enlum. d'Hist. Nat., 1783, p. 13.

§ Hist. Nat. Oiseaux, ed. Montbeillard, VI, 1775, p. 243.

‖ Ornith., III, 1760, p. 102.

NOMENCLATORIAL NOTES ON MILK SNAKES.

Referring to the treatment in the Check List of North American Amphibians and Reptiles, by Stejneger and Barbour, of the North American milksnakes belonging to the genus *Lampropeltis*, especially the group corresponding to Cope's genus *Osceola* (as distinguished from the original use of this name by Baird and Girard) which should be known as *Sphenophis* Fitzinger, 1843, I have been asked repeatedly what has become of the old well-known names *L. doliata* (Linnæus), *L. coccinea* (Schlegel) and *L. annulata* Kennicott. In the check list only the following names occur: *L. elapsoides* (p. 88); *L. triangulum triangulum* (p. 89); *L. triangulum amaura*; and *L. triangulum gentilis* (p. 90).

To begin with *L. annulata*, Kennicott's paratype, from Brownsville, Texas, upon which this name was based in 1860, I can not now distinguish specifically from Baird and Girard's *Ophibolus gentilis* (1853) based upon a specimen collected by Capt. Marcy, June 14, 1852, in a locality on the North Fork of the Red River, near Sweetwater Creek, Wheeler Co., Texas.

As for *Coronella coccinea* of Schlegel, 1837, it must first be noted that he describes it as having 17 scale rows, being undoubtedly the same form which Holbrook the following year described as *Coluber elapsoides*. This would give Schlegel's name the priority, but the name is not original with him, as he quotes *Coluber coccineus* of Latreille, 1802. This name, however, is antedated by Blumenbach's *Coluber coccineus* (1788). Latreille's and Blumenbach's name, however, undoubtedly refers to the same species, Schlegel's statement to the contrary notwithstanding. Thus this name which has caused so much confusion fortunately drops out as unavailable.

Finally, Linnæus in the twelfth edition of the Systema Naturæ, 1766, vol. 1, p. 379, describes a *Coluber doliatus* from Carolina, collected by Garden, with a scale formula of 164 ventrals and 43 caudals as follows: "Hæ fasciæ nigræ non perfecte cingunt abdomen, sed lateribus connectuntur cum remotiori, unde perfecti annuli dorsales." This is certainly not the form which later has been known as *Ophibolus* or *Lampropeltis doliatus*. It is not unlikely, in fact there is great probability, that he had a *Cemophora coccinea*, but the type has apparently disappeared and the question of its identity may never be established with such certainty as to justify us in substituting the Linnæan name for Blumenbach's well-known species. —*Leonhard Stejneger.*

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PROCEEDINGS

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TWO NEW MANZANITAS FROM THE SIERRA NEVADA OF CALIFORNIA.

BY C. HART MERRIAM.

The manzanitas of the Ponderosa Pine belt of the west flank of the Sierra Nevada, notwithstanding their abundance and conspicuousness, have been surprisingly slow in claiming the attention of botanists, and two of the most widespread species—*viscida* and *manzanita*, both of which occur also in the inner coast ranges north of San Francisco Bay—remained unnamed until 1887, when they were described by Parry; while *patula* of Greene escaped until 1891, and *mariposa* of Dudley until 1892. Even at this late day two additional strongly marked species from the same region appear to have eluded the keen eyes of botanists. One of these, the one here named *mewukka* after the Mewuk Indians of the region, has a wide range from Mariposa County to Nevada County and has been known to me for many years; the other, named *nissenana* after the Nissenan Indians (one of the southern divisions of the Midu stock), seems to be rare. I discovered it in August, 1907, on a low ridge southwest of American Flat, about midway between Placerville and Georgetown, in Eldorado County. It appears to belong to the *canescens* group, but differs rather strikingly in the character of bark, which, instead of being smooth and polished, is *fibrous*.

The two new species may be known from the following descriptions:

Arctostaphylos mewukka sp. nov.
(Plates II and III)

A strong erect shrub 1½–2 meters high, with slender smoothly polished dark purple branches, longish, pointed leaves of dull grayish green, long

slender bract tassels, and large smooth blackish berries externally resembling those of *patula* and containing a solid or little-divided stone imbedded in thick pulp. *Leaves* 40–50 mm. in length, pale dull grayish green, similar on both sides, lanceolate to elliptical, acute pointed (rarely bluntly rounded), often mucronate; glabrous; ribbed and finely reticulate; midrib usually purplish and conspicious basally (often throughout), petioles 6–8 mm. *Bract tassels* long (40–50 mm. when fully grown), minutely scurfy-puberulent; bracts narrowly foliaceous, deciduous, the lower about 8 mm., the others smaller, sometimes evenly graduated, decreasing upward; mature bract scales small, carinate, recurved, usually becoming awn-pointed. *Pedicels* with a slender elongate bract at base, 12–15 mm. long. *Drupe* globular, large, smooth, dark mahogany brown (appearing black at a little distance), umbilicate at point of attachment, and with a marked pit at opposite pole; pericarp thick; nutlets either a single stone or one large and two or three small segments, indistinctly ribbed or rugose. Flowers unknown.

Type No. 871392 U. S. Nat. Herbarium. Collected 3 miles above Colfax on ridge between North Fork American River and Bear River, November 5, 1911, by C. Hart Merriam.

Distribution and Associates.—Arctostaphylos mewukka is a characteristic species of the lower part of the open Ponderosa pine forest belt (Transition zone) on the west flank of the Sierra, where it ranges from Yuba River south at least to the canyon of the Merced, and probably beyond these limits in both directions. In the northern part of its range it is associated with *A. manzanita* and *A. viscida;* in the southern part with *A. mariposa.* Among its other associates are mahala mats (*Ceanothus prostratus*), kit-kit-diz′-za (*Chamaebatia foliolosa*), soft-leaf buckthorn (*Rhamnus tomentella*), and poison oak (*Rhus diversiloba*). Its zone position therefore is below that of its congener, the mountain green manzanita (*A. putula*) and its associate the snow bush (*Ceanothus cordifolius*).

Specimens in the National Herbarium were collected by me in Tuolumne County at Priest Hill in 1906, in 'The Basin' on North Fork Tuolumne River, and at Bald Rock, five miles north of Tuolumne, in 1907; in Mariposa County on the mountains bordering Merced Canyon above El Portal in 1910; and in Placer County on the ridge between North Fork American River and Bear River in 1911. On the latter slope it ranges from three miles above Colfax up to Towle and Gorge stations —perhaps even higher.

The Mú-wa Indians of Yosemite call this species *Muk′-ko; A. mariposa* they call *A′-yeh.*

Arctostaphyos nissenana sp. nov.

(Plates IV and V)

An erect shrub about 1½ meters high with reddish brown *fibrous* bark, conspicuously different from the smoothly polished bark of most of the manzanitas. *Leaves* greenish, rather small (20–25 mm. long), elliptic to

Arctostaphylos mewukka Merriam.

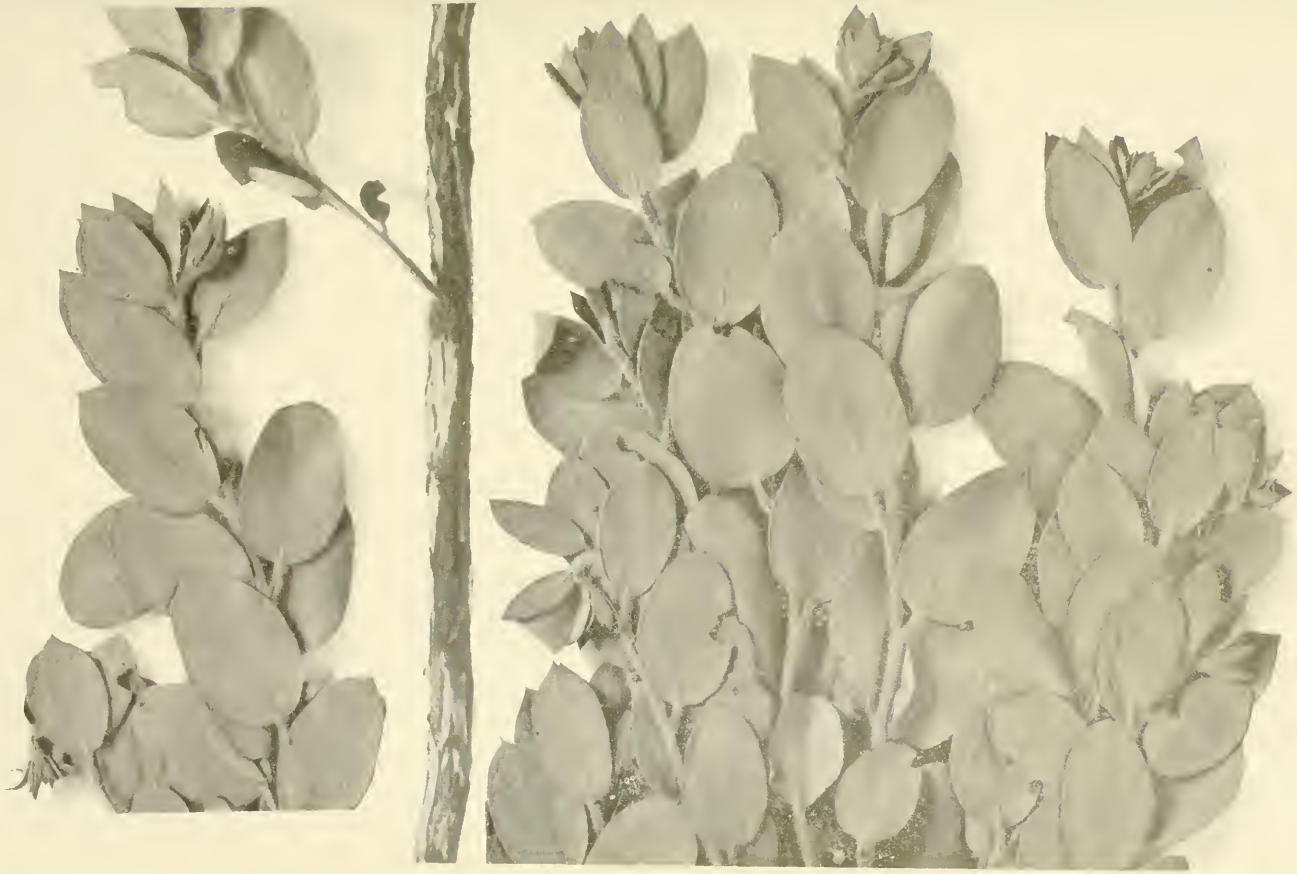
From near Colfax, Placer Co., Calif., Nov. 5, 1911. Type specimen No. 871392 U. S. National Herbarium. Not quite ½ natural size.

Arctostaphylos mewukka Merriam.

From near Colfax, Placer Co., Calif., Nov. 5, 1911. Type specimen No. 871392 U. S. National Herbarium. Natural size.

Arctostaphylos nissenana Merriam.

From near Louisville, Eldorado Co., Calif., Aug. 9, 1907. Type specimen No. 871390 U. S. National Herbarium. Not quite ½ natural size.



Arctostaphylos nissenana Merriam.

From near Louisville, Eldorado Co., Calif., Aug. 9, 1907. Type specimen No. 871390 U. S. National Herbarium. Natural size.

ovate elliptic, mucronate, edges sparsely ciliate basally; *petiole* short (2–3 mm.), hirsute; *branchlets*, *peduncles*, and *bracts* hispid; *bract clusters* short, as in *canescens* (not exceeding the basal bracts), but less dense and less uncinate than in *canescens*, and *hirsute* instead of lanuginous pubescent; bracts petiolate, foliacious, lanceolate from acute base. Flowers and fruit unknown.

Type No. 871390 U. S. Nat. Herbarium. Collected 2 or 3 miles north of Louisville, Eldorado Co., Calif. (SW of American Flat and near top of a low ridge, alt. 2300–2400 ft.) Collected August 9, 1907, by C. H. M.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GEOGRAPHIC VARIATION IN *CITELLUS TERETICAUDUS*.

BY JOSEPH GRINNELL.

(Contribution from the Museum of Vertebrate Zoology of the University of California.)

In studying the ground squirrels of California for the purpose of preparing a general synopsis of the same, it has been found necessary to make comparisons with material from other regions. In doing this with *Citellus tereticaudus* the writer has become convinced of the desirability of recognizing by name a new subspecies from Arizona, as follows:

Citellus tereticaudus arizonae, subsp. nov.

ARIZONA ROUND-TAILED GROUND SQUIRREL.

Type.—From Tempe, Maricopa County, Arizona; no. 25485, Univ. Calif. Mus. Vert. Zool.; ♀ adult, in complete summer pelage; collected by H. S. Swarth, May 30, 1917; orig. no. 10596.

Characters.—As compared with *Citellus tereticaudus tereticaudus*, *C. t. chlorus* and *C. t. eremonomus*, of the Colorado and Mohave desert regions west of the Colorado River, coloration of upper surface more reddish, and tail shorter.

Color.—On back, top of head and tail, deep pinkish cinnamon, becoming paler on neck, shoulders and sides, due to the greater extent of the minute white tippings to the hairs. Sides of head, lower surface, and feet, dull white.

Measurements.—Of type: Total length, 243 millimeters; tail vertebrae, 76; hind foot, 35. Eight adults from the Arizona side of the Colorado River valley average: Total length, 234.1: tail vertebrae, 76.0; hind foot, 35.1.

Remarks.—As material accumulates representing more generally the range of *Citellus tereticaudus*, it becomes clearly apparent that at least four subspecies are worthy of recognition, distinguished rather easily from one another by tone of coloration. *Citellus tereticaudus eremonomus* Elliot, of Death Valley, Inyo County, California, exhibits a wood brown

tone; *C. t. chlorus* Elliot, of the northwestern arm of the Colorado Desert, in Riverside County, California, is avellaneous; *C. t. tereticaudus* (Baird), of the Colorado and Mohave deserts, in Imperial, extreme eastern Riverside, and San Bernardino counties, California, is light pinkish cinnamon; while *C. t. arizonae*, of southwestern Arizona, is deep pinkish cinnamon. The color-terms here used are taken from Ridgway's "Color Standards and Color Nomenclature," 1912.

That the last two specified forms exist, and that the Colorado River is the dividing line between them, was evidently believed by Mearns, who says of *Citellus tereticaudus* (Bull. 56, U. S. Nat. Mus., 1907, pp. 336–337): "Specimens from the Tule and Yuma deserts, to the eastward of the Colorado River, are more reddish than those taken at the same season on the western part of the Colorado Desert." The present writer (Grinnell, Univ. Calif. Publ. Zool., vol. 12, 1914, pp. 224–225) went into the matter more in detail, showing that the characters hold right up to the river, but he did not at that time have at his disposal sufficient material to justify separation of the races by name.

The type-locality of *Citellus tereticaudus*, according to Mearns (loc. cit.), is "Old Fort Yuma, San Diego [now Imperial] County, California (on the right bank of the Colorado River, opposite the mouth of the Gila River and the present town of Yuma, Arizona)."

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW HYDNOCERA (COLEOPTERA : CLERIDAE).

BY EDWARD A. CHAPIN.

The material upon which the following diagnosis is based was received through Mr. A. B. Wolcott from Mr. F. E. Blaisdell, Sr. Having had the opportunity of comparing these specimens with authentic specimens of the allied species and finding the differences to be constant, I offer the following description :

Hydnocera binotata, nov. sp.

Moderately elongate; aeneous, elytra each with a pale spot slightly post median: antennae except club, and main part of legs testaceous; antennal club and mouth parts piceous. Head (with the prominent eyes) as wide as the elytra at the humeri, very finely and densely punctured, densely pubescent with short, depressed, silvery pubescence. Thorax slightly broader than long (37–42), sides prominently dilated slightly before the middle, sides behind dilations nearly parallel, apical transverse impression distinct, not deep, slightly V shaped, basal transverse impression straight, rather deep, very close to basal margin of thorax. Lateral foveae shallow, not sharply delineated. Surface very densely punctured, the punctures more coarse than those of head but finer than those of the elytra. Pubescence very dense, depressed and silvery, with a few pale erect hairs intermingled. Scutellum densely pubescent. Elytra slightly shorter than abdomen, dehiscent from apical third, sides distinctly convergent towards apices, which are evenly rounded, strongly serrate and somewhat tumid. Surface coarsely and very densely punctured, the punctures on the apical two-fifths (behind pale maculation) confluent. Pubesence moderately dense, depressed. Color metallic black with reddish luster, each with a transversely oval pale spot at apical two-fifths. Under parts greenish black, densely pubescent except for posterior coxae which are striate and nearly glabrous. Legs, excepting coxae, rufo-testaceous, knees of middle and hind legs darker. Length: 3–4 mm.

Described from four specimens taken at Mokelumne Hill, Placer Co., Cal.; Aug. 19, 1916, by Mr. Walter M. Gifford, Commissioner of Agriculture, Honolulu, Hawaii. The male type is in the Wolcott collection, the female type in the collection of the author, the paratypes (2) returned to Mr. Blaisdell.

Close to *H. cribripennis* Fall from which it is easily separable by the form and sculpture of the thorax. In *H. cribripennis* Fall the thoracic ratio is 38:47 as compared with 37:42 for *binotata* and the apical impression is straight not V shaped.

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OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GENERA OF THE EUPTERYGIDAE (HOMOPTERA; JASSOIDEA).

BY W. L. McATEE.

The group of leaf-hoppers here called the Eupterygidae has been treated variously by recent authors as a family, subfamily or tribe. Some of the earliest writers included all the forms in a single genus. Without going into the history of the group names* that have been applied to the Eupterygidae, it may be said that Kirkaldy† appears to have been the first to use a name (Eupteryginae) based upon that of the oldest genus.

It has been a very general practise to base family names on the earliest available genus name and probably the only reason it was not previously done for this group is that the question of priority between two of the oldest genera (published in the same year) was very generally disregarded. Kirkaldy realized the situation, in part, but apparently did not know the whole truth. Indeed the present paper contains more evidence as to the exact dates of publication of these two names than has been cited in any other discussion of the subject.

Codes of nomenclature do not specify methods of selecting family names and practise varies, although as above stated, most of the names in current use are those based on the oldest genera. The writer believes that this should be the rule, for several reasons. First a definite method is needed and one in accord with the majority of precedents has much to recommend it. The fact that many of the family names have been selected because they were the oldest as such, does not weaken the argu-

*These can be learned by consulting Oshanin, Verzeichnis, 1908, p. 187, and Van Duzee, Catalogue, 1917, p. 698. References in full to these and other works mentioned in the introduction are given on later pages.

†Bul. 1, Pt. 9. Exp. Sta. Hawaiian Sugar Planters' Asso. 1906, p. 356.

ment for basing them on the oldest genera, but on the contrary strengthens it since it is clearly evident that this principle itself guided the founders of most family names. When selection of the oldest family name is made the exact form of the name is ignored, and there may be chosen as a base a name quite unlike our modern standardized family names. This being true and the effort being merely to find the earliest group name, why not select as root name the name which has genuine priority, namely that of the earliest genus especially since in many cases this has about the same scope as what we now regard as families. This name embodies the first effort at classification in the group concerned and formation of the family name from it is fitting recognition of pioneer work.

Hence I prefer for the group of leaf-hoppers here considered the name Eupterygidae, based upon the oldest genus, *Eupteryx*, and I put it in family form, because I believe the group can logically be treated only as a family. In keys to leaf-hoppers this group is contrasted to all others by the veins of the tegmen running without branching or juncture of any kind (except theoretical or rarely actual juncture at base), to the apical cross veins, there being therefore no anteapical cells. This is a clear cut and important character separating the Eupterygidae from all other leaf-hoppers. Moreover it is one scarcely subject to intergradation. It is supported by another peculiarity in venation which distinguishes this group from all Homoptera Auchenorhynchi, namely the possession of only one vein on disc of clavus, the first anal practically coinciding with claval suture and the third anal with claval margin. Ocelli are seldom conspicuous, sometimes lacking.

A feature of less importance, but one which has not received attention from writers on Eupterygidae is the general occurrence in some genera of costal plaques. These are encrustations of a substance, between pruinosity and wax in consistency, on definite elliptical areas at about the middle of each costa. They suggest the much heavier and more conspicuous plaques observed on many specimens of *Oncometopia*. The areas on which these plaques occur in Eupterygidae are regarded as definite, because of repeated observations of their location, because they may be recognized when the encrustation is lacking, and most important of all because these areas are often distinctly colored. The

color is modified or obscured by its covering. The plaques flake off naturally, stages in the process being easily found, and they may be removed readily with a needle.

The venational characters by which the Eupterygidae are distinguished from other Jassoidea result from simplification. That this reduction in wing veins is specialization is the belief of Hansen, Kirkaldy, and Metcalf, and if so accepted gives the Eupterygidae an advanced position among the Jassoidea of the world, and the most advanced among the groups inhabiting the United States. In this case at least being specialized does not mean having comparatively fixed characters. On the contrary the Eupterygidae are truly protean and now evidently in active evolution. From the synopsis of genera (page 122) it will be seen that practically all the possible combinations of the principal venational characters of the family are realized in the genera now known. The venation usually is variable in details, and as for range and variation in color there seems to be no limit. The total number of species in the group, a great share of which await discovery and description, no doubt is extremely large.

Genera Proposed for Eupterygidae and Their Type Species.

1833, January. EUPTERYX. Curtis, John. Characters of some undescribed Genera and Species indicated in the "Guide to an Arrangement of British Insects." The Entomological Magazine, 1, No. 2, Jan., 1833, p. 192.

Curtis here describes as new the species *hortensis* and remarks: "the type of our genus *C. picta* Fab." Curtis may not have had in mind the reasons for designating a type species that we now recognize as so important, but certain it is that the action he took must be recognized as a definite type selection. The species he mentions *Cicada picta* Fabricius* is considered a synonym of *C. atropunctata* Goeze.†

Eupteryx atropunctata Goeze therefore is the genotype by original designation of its synonym.

Emendation: *Eupterix*. Fieber, F. X. Neue gattungen und arten in Homoptern (Cicadina Bur.). Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien. 16, 1866, p. 509.

* Fabricius, J. C. Systema Rhyngotorum secundum Ordines, Genera, Species, adiectus, Synonymis, Locis, Observationibus, Descriptionibus, 1803, No. 75, p. 77.

† Goeze, J. A. E. Entomologische Beytrage zu des Ritter Linne zwölften Ausgabe des Natursystems. II, 1778, pp. 161–2. Based on Cicada viridi-flava, elytris punctis tribus nigris apice fuscis. Geoffroy, E. L. Histoire abregee des Insectes, etc., I, 1762, p. 426.

Synonyms:* *Typhlocyba* Germar 1833 (in part); *Diomma* Motschoulsky, 1863. Which see under those dates.

1833, July or later. TYPHLOCYBA. Germar, E. F. Conspectus generum Cicadariarum. Revue Entomologique (Silbermann), 1, 1833, p. 180.

There has been some difference of opinion as to priority between this name and *Eupteryx* Curtis; as both were published in the year 1833. However the internal evidence to be found in the volumes of the respective references leave one in amazement that any misunderstanding could have arisen as to the dates of publication of the names *Eupteryx* and *Typhlocyba*. The Entomological Magazine was inaugurated as a quarterly and the first issue was for September, 1832. The difficulties attending the launching of a new publication were, therefore, out of the way before time for the second number, that in which we are specially interested, since it contains on page 192 the original description of *Eupteryx*. This issue of the Magazine is dated January, 1833, and it is certain not only that it was published in that month but early in the month (before the 10th) as evidenced by a communication dated January 10, 1833, published in the April issue, which criticises the "admission into your last number" of certain of the generic names of Curtis in the very article with which we are concerned. Thus the January, 1833, issue of the Entomological Magazine was not only published before the 10th of the month, but had reached a subscriber in time to enable him to write a letter of criticism by that date.

Evidence derived from the pages of Silbermann's Revue Entomologique leaves no doubt whatever that Germar's genus *Typhlocyba* was published some months later than Curtis's *Eupteryx*. In the first place the volume was issued in 6 (if not more†) brochures and it is fair to presume that then as now the separate issues were distributed through the year. We should expect therefore that in a 6 part volume, part 4 (in which the genus *Typhlocyba* was originally described) would have been issued after the middle of the year. That this was in fact the case is shown by dates signed to communications in the various numbers. Thus at page 140 in brochure 3 is an exchange list dated May, 1833, and on page 247 in part 6 a postscript dated October 29, 1833. Of greatest interest in this connection, and absolutely convincing as to the earliest possible date of Germar's paper (on page 184, brochure 4) is his signature to the article dated Halle, July 3, 1833.‡. If the Conspectus Generum Cicadariarum was published

* The genera of Eupterygidae have received different treatment from practically every author. I cite only the important synonymy and usually only that supported by my own investigations.

† Bibliographie de la France 22, No. 16, April 20, 1833, p. 254, states that the Revue is promised monthly, but from the volume I have examined the number of brochures appears to have been six.

‡ How this date has been overlooked and ignored is hard to understand. Even Kirkaldy, a nomenclatorial specialist, who appreciated the priority of *Eupteryx*, remarks (Bul. 1, Part 9, Exp. Sta. Hawaiian Sugar Planters' Assoc., 1906, p. 357) that Germar's paper was published "before Easter."

in the month of July (certainly it was no earlier) it is clear that *Eupteryx* Curtis has at least 6 months' priority over *Typhlocyba* Germar.

Confusion has arisen between the two genera, also because the original description of neither was sufficient, and because the species originally included in them, were, with a single exception, the same. This has led to their being synonymized back and forth, without reference to priority or other merits of the case.

Woodworth in 1889* appears to be the first who thoroughly realized the difficulty and saw the necessity of designating a type. He says: "In proposing the name (*Typhlocyba*) Germar simply mentions the following species as forming the genus: *Cicada aurata*, *urticae*, *vittata*, *picta*, *quercus* Fab. etc. Now it is evident that one of these species must be taken as the type of the genus and as all except *quercus* belong to *Eupteryx* in its most restricted sense this species is the type."

Distant† (1908) and Oshanin‡ (1912) concur in this designation.

Westwood§ in 1840 selected *C.* [*icada*] *ulmi* Linnaeus as the typical species of *Typhlocyba*, but the choice is invalid as *ulmi* is not one of the originally included species. Similarly even if Fieber's use‖ of *T. lineatella* Fallen as an illustration of the genus could be construed as a type designation it would be invalid for the same reason.

Van Duzee's placing¶ *Eupteryx* as a synonym of *Typhlocyba* is a repetition of an old error; this course is prevented by priority and by the fact that the two genera are distinct on the basis of validly selected types. His choice of [*Cicada*] *aurata* Linnaeus as type is of course barred by Woodworth's previous valid designation of *quercus* Fabricius.**

Synonyms: *Anomia* Fieber, 1866; *Empoa* Fitch, 1851; *Zyginella* Löw, 1855. Which see.

1850. DIKRANEURA. Hardy, James. Descriptions of some new British Homopterous Insects. Transactions of the Tyneside Naturalists' Field Club. I, p. 423, 1850.

Monobasic: *D. variata* new species, Hardy op. cit. pp. 423–4, genotype.

Emendations: *Dicranoneura*, Donglas, J. W. Notes on British Homoptera, with descriptions of additional species (Part 2). The Entomologists' Monthly Magazine, 12, July, 1875, p. 27.

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* Woodworth, C. W. North American Typhlocybini. Psyche 5, May-July, 1889, p. 211.

† The Fauna of British India, Rhynchota Vol. IV, 1908, p. 409.

‡ Oshanin, B. Katalog der paläarktischen Hemipteren (Heteroptera, Homoptera-Auchenorhyncha and Psylloideae) 1912, p. 113.

§ Westwood, J. O. An introduction to the modern classification of Insects founded on the natural habits and corresponding organisation of the different families. Vol. II, 1840, Synopsis of the genera of British Insects, p. 117.

‖ Verh. K. K. Zool.-Bot. Ges. Wien. 16, 1866, p. 509.

¶ Van Duzee, E. P. Check list of the Hemiptera (excluding the Aphididae, Aleurodidae and Coccidae) of America, North of Mexico. 1916, p. 77: Catalogue of the Hemiptera of America north of Mexico, excepting the Aphididae, Coccidae and Aleurodidae. 1917, p. 707.

** Cicada quercus Fabricius, J. C. Entomologia Systematica emendata et aucta secundum Classes, Ordines, Genera, Species, adiectus Synonymis, Locis, Observationibus, Descriptionibus, IV, 1794, p. 47.

Dicraneura, Puton, A. Catalogue des Hemipteres (Heteropteres, Cicadines et Psyllides) de la Faune Palearctique, 3rd ed. 1886, p. 86.

Dicroneura, Woodworth, C. W. On the genus Cicadula Zett. Psyche, 5, July-Aug., 1888, p. 75.

Synonyms: *Chloroneura* Walsh 1862 (in part); *Erythria* and *Notus** Fieber, 1866. Which see.

1851. ERYTHRONEURA. Fitch, Asa. Catalogue with references and descriptions of the Insects collected and arranged for the State Cabinet of Natural History. Fourth Annual Report of the Regents of the University of the State of New York on the State Cabinet of Natural History, 1851, p. 62. Reprint Ninth Report on Insects of New York, J. A. Lintner, 1893, p. 402.

Described to include the new species *E. vulnerata* op. cit. pp. 62–63, and 402–3, *E. affinis* and *E. tricincta* op. cit. p. 63 and 403, and *Tettigonia vitis* Harris, *T. obliqua* Say and *T. fabae* Harris.

The type species of this genus was not designated until 1912, when Oshanin chose† *E. tricincta* Fitch.

Synonyms: *Zygina* and *Idia* Fieber, 1866.‡ Which see.

1851. EMPOA. Fitch, Asa. Catalogue Fourth Ann. Rep. Regents Univ. N. Y. on State Cabinet Nat. Hist. 1851, p. 63, Reprint Ninth Rep. Ins. N. Y. Lintner, 1893, p. 403.

Established to include the new species *E. querci* and *E. coccinea* op. cit. p. 63 and 403.

Woodworth§ synonymizes this genus with *Typhlocyba* Germar, an action concurred in by Distant, 1908 (see below), and Oshanin 1912.‖

Van Duzee, 1916, because of his erroneous application of the names *Typhlocyba* and *Eupteryx* to the same genus, keeps *Empoa* in use. He cites¶ *E. querci* Fitch as genotype. Later in his Catalog** Van Duzee inadvertently gives Distant as the authority for the selection of "*quercus*" Fitch as the type species. What Distant really did†† was to cite as genotype of *Typhlocyba* of which he placed *Empoa* as a synonym, *T. quercus* Fabricius.

The question as to whether a change of name is called for because of the presence of *quercus* Fabricius and *querci* Fitch in the same genus is a nice one. The name *quercus* was originally given as a noun in apposition however, and will retain this form, its own nominative singular, whatever shifts of genera it may undergo. The name *querci*, given originally as an

* These two genera were declared synonymous with each other by Fieber, himself in Katalog der Europaischen Cicadinen, 1872, p. 14.

† Kat. Pal. Hemip. 1912, p. 114.

‡ These two groups were declared synonymous with each other by Fieber, Katalog, 1872, p. 15.

§ Psyche, V, 1889, p. 212.

‖ Kat. Pal. Hemip. 1912, p. 113.

¶ Check-list, 1916, p. 77.

** Catalogue, 1917, p. 708.

†† Fauna British India Rhynchota IV. 1908, p. 409.

adjective in the genitive, will always have a genitive ending irrespective of the genus to which it may be assigned. No change in nomenclature therefore will make the two names exactly alike; hence they would appear to differ sufficiently so that both may be retained. Advocates of the "one-letter rule," at least, will take this view.

1862. EMPOASCA. Walsh, Benj. D. Fire-blight. Two new foes of the apple and pear. The Prairie Farmer, 10, No. 10, Sept. 6, 1862 (Entomological note, pp. 148–9), p. 149, Fig. V. Reprinted with slight changes in Proceedings of the Boston Society of Natural History, 9, Feb.-March, 1864, p. 315.

Described to include the new species *E. viridescens*, *E. consobrina* and *E. obtusa* op. prim. cit. p. 149.

Distant, 1908, cites* as genotype *E. viridescens* Walsh, a valid designation. Oshanin, 1912, states† that *Cicada smaragdula*‡ is the type of this genus. This of course is incorrect as *smaragdula* is not one of the originally included species.

Synonyms: *Chloroneura* Walsh, 1862 (in part); *Chloria* and *Kybos* Fieber, 1866; *Chlorita* Fieber, 1872. Which see.

1862. CHLORONEURA. Walsh, Benj. D. Prairie Farmer, 1862, p. 149, Fig. VI. Reprint Proc. Bost. Soc. Nat. Hist. 1864, p. 315. Established to include the new species *C. abnormis*, *C. malefica* and *C. maligna*, op. prim. cit. p. 149.

In part a synonym§ of *Dikraneura* Hardy in part of *Empoasca* Walsh.§

1863. DIOMMA. Motschoulsky, Victor de. Essai d'un Catalogue des Insectes de l'Ile Ceylan. Part 2. Bulletin de la Societe Imperiale des Naturalistes de Moscou. 36, 1863, p. 102.

Monobasic. *D. ochracea* new species Motschoulsky, op. cit. pp. 102–3, Pl. 2, fig. 21, genotype.

Melichar, 1903,‖ places *Diomma* as a synonym of *Eupteryx* Curtis.

1863. CONOMETOPUS. Motschoulsky, Victor de. Bul. Soc. Imp. Nat. Moscou. 36, 1863, pp. 103–4.

Monobasic: *C. inspiratus* new species, Motschoulsky, op. cit. p. 104, Pl. 2, fig. 22, genotype.

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* Fauna of British India. Rhynchota, IV, 1908, p. 401.

† Kat. Pal. Hemip. 1912, p. 112.

‡ Kirkaldy's remark (Bul. 1, Part 9, Exp. Sta. Hawaiian Sugar Planters' Assoc., 1906, p. 357) that Sahlberg made this species the type of *Cicadula* is unfounded. Sahlberg's action (Notiser Fauna et Flora Fennica Forh. 12, 1871, p. 159) by no means can be construed as fixation of a type. What happened is this: Fieber, 1866, removed to other genera certain species of Zetterstedt's (1838) *Cicadula* complex; Sahlberg, 1871, merely put some of them back, a procedure in no wise affecting ultimate disposition of the genera, nor their nomenclature. *Cicadula* was definitely excluded from the Eupterygidae by type fixation, by Woodworth, 1888, if not earlier.

§ Woodworth, C. W. Psyche 5, 1899, pp. 212, 213.

‖ Melichar, L., Homopteren-Fauna von Ceylon, 1903, p. 210.

In 1905* Kirkaldy changes this name on account of preoccupation to *Motschulskyia*. *Conometopus* Motsch. is preoccupied by *Conometopus* Blanchard† in the Orthoptera.

The position of this genus is uncertain; it may be an equivalent of *Heliona* Melichar, 1903. Which see.

1866. COMPSUS. Fieber, F. X. Neue gattungen. Verh. K-K. Zool.-Bot. Gesell. Wien 16, 1866, p. 507, Pl. VII, fig. 22.

In this paper Fieber describes 8 groups of Typhlocybidae as new genera and lists from one to three species in each. These must be considered therefore merely as illustrations of the genera, the author having no intention of designating definite types. In case only one species is mentioned however this becomes the type by reason of being the only originally included species.

For *Compsus* the illustrations given are *C.* [*icada*] *elegantula* Zetterstedt, *C. discicollis* Herrich-Schäffer and *C. albostriella* Fallen. *C. elegantula* is considered a synonym and *C. discicollis* a variety of *albostriella*, hence *Compsus* is fortuitously monobasic and the type species is *albostriella* Fallen, 1826.‡

In 1872, Fieber having found the name *Compsus* preoccupied,§ proposed‖ in its place *Alebra*.

1866. ERYTHRIA. Fieber, F. X. Neue gattungen Verh. K.-K. Zool.-Bot. Gesell, Wien 16, 1866, p. 507, Pl. VII, fig. 23.

Monobasic: *C.* [*icada*] *aureola* Fallen,¶ the only species included.

In 1872 Fieber places** *Erythria* as a synonym of *Notus*, an invalid action as it has page priority over the latter name. Puton considers†† it a synonym of *Dikraneura*, an action supported by Gillette.‡‡

1866. NOTUS. Fieber, F. X. Neue gattungen. Verh. K.-K. Zool.-Bot. Gesell. Wien. 16, 1866, pp. 507–8, Pl. VII, fig. 24.

The species given as examples of this group are [*Cicada*] *flavipennis* Zetterstedt and its synonym *C. orichalcea* Dahlbaum, and *T.* [*yphlocyba*] *forcipata* Flor.

This group is considered synonymous with *Dikraneura* Hardy.§§

* Kirkaldy, G. W. Neue und wenig bekannte Hemiptera. Wiener Entomologische Zeitung, 24, 1905, p. 266.

† Blanchard, Emilio. Fauna Chilena Insectos. Ortopteros. Historia Fisica y Politica de Chile. (C. Gay.) Zoologia Tom. VI, 1851, pp. 67-68.

‡ Fallen, C. F. Hemiptera Sueciae. Cicadariae, 1826, p. 54.

§ By *Compsus*, Schoenherr, C. J. Curculionidum Dispositio Methodica cum generum characteribus, descriptionibus atque observationibus seu Prodromus ad Synonymiae Insectorum IV, 1826. pp. 109–110.

‖ Fieber, F. X. Katalog der europaischen Cicadinen, 1872, p. 14.

¶ Fallen, C. F. Hemiptera Sueciae. Cicadariae, 1826, p. 39. Based on Acta Holmiana 1806, p. 25.

** Katalog Cicadinen, 1872, p. 14.

†† Catalogue. 3rd Ed. 1886, p. 86.

‡‡ Gillette, C. P. American Leaf-hoppers of the subfamily Typhlocybinae. Proc. U. S. Nat. Mus. 20, p. 709, April 20, 1898.

§§ First so placed by Douglas, Ent. Mo. Mag. 12, July, 1875, p. 27.

1866. CHLORIA. Fieber, F. X. Neue gattungen. Verh. K.-K. Zool.-Bot. Gesell. Wien. 16, 1866, p. 508, Pl. VII, fig. 25.

The illustrations of this genus are *Cic.* [*ada*] *viridula* Fallen and *Typhl.* [*ocyba*] *pura* Stal.

In 1872, Fieber having found the name *Chloria* preoccupied,* proposed† in its place *Chlorita*. Which see.

1866. KYBOS. Fieber, F. X. Neue gattungen. Verh. K.-K. Zool.-Bot. Gesell. Wien. 16, 1866, p. 508. Pl. VII, fig. 26.

The examples of this group are *Cic.* [*ada*] *smaragdula* Fallen and *Typhl.* [*ocyba*] *commissuralis* Stal.

Emendation: *Cybus*, Douglas. Ent. Mo. Mag. 12, July, 1875, p. 26.

A synonym of *Empoasca* according to Gillette,‡ Oshanin,§ and Van Duzee.‖

1866. ANOMIA. Fieber, F. X. Neue gattungen. Vehr. K.-K. Zool.-Bot. Gesell. Wien. 16, 1866, pp. 508–9, Pl. VII, fig. 27.

The species cited as illustrations of Anomia are *Cic.* [*ada*] *quercus* Linnaeus and *cruenta* Herrich-Schäffer.

Placed as a synonym of *Typhlocyba* Germar by Lethierry,¶ an action concurred in by Puton** and Oshanin.††

1866. ZYGINA. Fieber, F. X. Neue gattungen. Verh. K.-K. Zool.-Bot. Gesell. Wien. 16, 1866, p. 509, Pl. VII, fig. 28.

Monobasic [*Typhlocyba*] *nivea* Mulsant the only species cited.

Gillette synonymizes‡‡ this name with *Typhlocyba* Germar and Van Duzee with *Erythroneura* Fitch.§§

1866. IDIA. Fieber, F. X. Neue gattungen. Verh. K.-K. Zool.-Bot. Gesell. Wien. 16, 1866, p. 509, Pl. VII, fig. 29.

A single species *Typhlocyba scutellaris* Herrich-Schäffer (with its synonym *T. pullula* Boheman) only is cited for *Idia*, the group therefore being monobasic.

In 1872 Fieber places‖‖ *Idia* as a synonym of *Zygina* Fieber, 1866. This action has been acquiesced in by later writers who according to their points of view synonymize it either with *Erythroneura* or with *Typhlocyba*.

* By *Chloria* (Diptera) Schiner, J. R. Vorlaufiger Commentar zum dipterologischen Theile der Fauna Austriaca. IV. Wien. Ent. Monats. VI, No. 5, May, 1862, p. 151.

† Fieber, F. X. Katalog Cicadinen, 1872, p. 14.

‡ Proc. U. S. Nat. Mus. 1898, p. 709.

§ Verzeichnis der Palaearktischen Hemipteren mit besonderer Berücksichtung ihrer Verteilung im Russischen Reiche. II, 1908, p. 197.

‖ Checklist, 1916, p. 76.

¶ Lethierry, L. as editor of Fieber, F. X., Description des Cicadines d'Europe. Revue d'Entomologie, III, 1884, p. 120.

** Catalogue. 3rd Ed. 1886, p. 88.

†† Verzeichnis, 1908, p. 208.

‡‡ Proc. U. S. Nat. Mus. 1898, p. 709.

§§ Checklist, 1916, p. 77.

‖‖ Katalog Cicadinen, 1872, p. 15.

The only peculiar character assigned for the genus, an extra cell on tegmen basad from fourth apical cell, must be either of freakish occurrence, or the genus does not pertain to the Eupterygidae.

1872. ALEBRA. Fieber, F. X. Katalog Cicadinen, 1872, p. 14.

Proposed as a substitute for *Compsus* Fieber, 1866, not *Compsus* Schoenherr, 1826, Coleoptera. Which see under *Compsus* 1866.

Alebra automatically takes the genotype of *Compsus*, namely *Cicada albostriella* Fallen.

1872. CHLORITA. Fieber, F. X. Katalog Cicadinen, 1872, p. 14.

Proposed as a substitute for *Chloria* Fieber, 1866, not *Chloria* Schiner, 1862, Diptera. Which see under *Chloria* 1866.

Gillette* and Van Duzee† synonymize this with *Empoasca* Walsh.

1886. ZYGINELLA. Löw, Paul. Beiträge zur Kenntniss der Cicadinen. Verh. K.-K. Zool.-Bot. Gesell. Wien. 25, 1886, p. 346.

Monobasic, *Z. pulchra* new species, Löw, op. cit. pp. 346–7.

Gillette considers‡ this a synonym of *Typhlocyba* Germar. European authorities have kept it separate.

1899. PROTALEBRA. Baker, C. F. On Alebra and related genera. Psyche 8, p. 402, Sept., 1899.

Type by original designation *Alebra curvilinea* Gillette.§

1899. EUALEBRA. Baker, C. F. Psyche 8, p. 402, Sept., 1899.

Monobasic, *E. smithii* new species Baker, loc. cit., genotype.

1900. NIRVANA. Kirkaldy, G. W. Notes on some Singhalese Rhynchota. The Entomologist, 33, Nov., 1900, p. 293.

Monobasic, *N. pseudommatos* new species, Kirkaldy, op. cit. pp. 293–4, genotype.

This genus was placed by Kirkaldy near the genus *Spangbergiella*, that is among the Dorydiid Jassini. Melichar, 1903, locates‖ it among the *Acocephalini*. His description and figures of the venation, however, are very suggestive of the Eupterygidae, where Kirkaldy locates the genus in 1907¶ in which he is followed by Oshanin, 1912.** The genus *Kosasia* (Distant, W. L. Insecta Transvaaliensia, I, p. 240, 1910) said to be related to *Nirvana* is not an *Eupterygid*, while the latter apparently is.

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* Proc. U. S. Nat. Mus. 1898, p. 709.

† Checklist, 1916, p. 76.

‡ Proc. U. S. Nat. Mus. 1898, p. 709.

§ Proc. U. S. Nat. Mus. 20, 1898, pp. 710-11.

‖ Homopteren Ceylon, 1903, p. 165.

¶ Bull. III, Exp. Sta. Hawaiian Sugar Planters' Assoc., 1907, pp. 67. 68.

** Katalog, 1912, p. 111.

1903. HELIONA. Melichar, L. Homopteren Ceylon. 1903, p. 215.

Described to include two new species, *H. constricta* Melichar, op. cit., pp. 216–6, Pl. 6, figs. 5a, b; and *H. bioculata*, op. cit., p. 216, Pl. 6, fig. 8.

By naming a new genus *Apheliona*,* with *biocula*[*ta*] as type, Kirkaldy thereby makes *constricta* the type species of *Heliona*. This is a wise choice as in *H. constricta* the generic characters mentioned by Melichar are most marked. Distant apparently independently chose *constricta* as genotype in 1908† and remarked that *bioculata* could scarcely be considered as congeneric.

1903. TYPHLOCYBELLA. Baker, C. F. A new genus of Typhlocybini. Invertebrata Pacifica, 1, p. 3, Sept. 15, 1903.

Monobasic, *T. minima* new species, Baker, loc. cit., genotype.

1905. MOTSCHULSKYIA. Kirkaldy, G. W. Wien. Ent. Zeit. 24, 1905, p. 266.

Proposed as a substitute for *Conometopus*, Motschoulsky, 1863, not *Conometopus* Blanchard of the Orthoptera. Which see under *Conometopus* 1863. This name may be a synonym of *Heliona* Melichar, 1903.

1906. ANEONO. Kirkaldy, G. W. Leaf-hoppers and their Natural Enemies (Pt. IX, Leaf-Hoppers-Hemiptera). Bull. No. 1, Part 9, Division of Entomology, Experiment Station of the Hawaiian Sugar Planters' Assoc., Feb. 3, 1906, pp. 358–9, Pl. 22, fig. 12, Pl. 31, figs. 2–3.

Monobasic, *A. pulcherrima* new species, Kirkaldy, op. cit. pp. 359–60, genotype.

Judging from Kirkaldy's figures of the elytral venation (Pl. 31, figs. 2–3), it does not seem possible that *Aneono* belongs to the Eupterygidae. If these drawings are correct the venation is extremely anomalous, and it would seem much better to create a new family to receive the genus, than to attempt to modify the characters of so homogenous a group as the Eupterygidae, in order to make them cover such an aberrant form. The anastomosing of veins and consequent formation of cells on the disk of the tegmen would seem to exclude *Aneono* from a group which has always been principally characterized by lack of such cells, the apparent 3 principal veins of the elytra (theoretically united at base) running without other connection or division up to the apical cross-veins.

1906. KAHAONO. Kirkaldy, G. W. Bul. 1, Part 9, Div. Ent. Exp. Sta. Hawaiian Sugar Planters' Assoc., Feb. 3, 1906, p. 361.

Monobasic, *K. hanuala* new species, Kirkaldy loc. cit.

1907. APHELIONA. Kirkaldy, G. W. Bul. III, Div. Ent. Exp. Sta. Hawaiian Sugar Planters' Assoc., Sept., 1907, p. 67.

* Kirkaldy, G. W. Leaf-Hoppers-Supplement (Hemiptera). Bull. No. III, Division of Entomology, Experiment Station Hawaiian Sugar Planters' Association, September, 1907, p. 67.

† Fauna British India. Rhynchota IV, 1908, p. 407.

Monobasic, *Heliona biocula*[*ta*] Melichar, Homopteren Ceylon, 1903, p. 216, genotype.

1907. DIALECTICOPTERYX. Kirkaldy, G. W. Bul. III, Div. Ent. Exp. Sta. Hawaiian Sugar Planters' Assoc., September, 1907, p. 71, Pl. 1, figs. 6–7.

Monobasic, *D. australica* new species, Kirkaldy, op. cit. p. 72, genotype.

Kirkaldy separates this genus and *Aneono* from the other genera he includes in the Eupterygidae by their having the second and third sectors of the tegmen united in a stalk apically. His figures of the venation of *Aneono* bear out his characterization for that genus, but further show so extremely anomalous a venation as to exclude the group from this family.

In *Dialecticopteryx* the case is not so clear, however. From his figure it is seen that the 2nd and 3rd sectors are united near the base, but this is not a surprising departure for an Eupterygid. Theoretically all the sectors join near or at the base, although usually they are visible nowhere near that point. Now as to the other point of peculiarity claimed by Kirkaldy his figure does not bear out his statement. The union of the second and third sectors in an apical fork is merely their connection by the usual crossvein. There is really nothing strikingly peculiar about the venation of the apical part of the tegmen. The venation of the wing in this genus is unknown and for that reason assignment to its proper place in the family (if it really belongs here) is impossible.

1908. HOMA. Distant, W. L. The Fauna of British India, Rhynchota Vol. IV, 1908, p. 400.

Monobasic, *H. insignis* n. sp. genotype, pp. 400–401.

1910. MOLOPOPTERUS. Jacobi, Arnold. Wissenschaftliche Ergebnisse der Schwedischen Zoologischen Expedition nach dem Kilimandjaro, dem Meru und dem umgebenden Massaisteppen Deutsch-Ostafrikas 1905–1906 (Y. Sjöstedt). 2. 1910, 12 Hemiptera, 7 Homoptera, pp. 133–134.

Monobasic, *M. nigriplaga* n. sp. op. cit. p. 134, genotype.

The chief character advanced for this genus, the large, elliptical swelling on costa, is, I suspect, nothing but a pronounced costal plaque such as I have discussed on pp. 110–111. The genus deserves recognition however because the veins of the elytra are thickened and conspicuous basally, something true of no other Eupterygid.

1914. AIDOLA. Melichar, L. Homopteren von Java, gesammelt von Herrn Edw. Jacobson. Notes from the Leyden Museum, 36, Nos. 1–2, March 31, 1914, pp. 142–3.

Type by original designation, *Typhlocyba orbata*, Melichar (Homopteren Ceylon, 1903, p. 216); one other included species. *A. fumistriga* n. sp. op. prim. cit., pp. 143–4.

Aidola seems to be very closely related to *Erythroneura*, from which the chief character advanced for distinguishing it is the presence of

ALPHABETICAL LIST OF THE GENERA OF EUPTERYGIDAE WITH THEIR TYPE SPECIES AND SYNONYMS AS NOW UNDERSTOOD.

Accepted name *Synonyms indented*	*Author*	*Date*	*Genotype*	*Author*	*Date*
Alebra	Fieber	1872	albostriella	Fallen	1826
Compsus	Fieber	1866			
Apheliona	Kirkaldy	1907	bioculata	Melichar	1903
Dialecticopteryx	Kirkaldy	1907	australica	Kirkaldy	1907
Dikraneura	Hardy	1850	variata	Hardy	1850
Chloroneura (in part)	Walsh	1862			
Erythria	Fieber	1866			
Notus	Fieber	1866			
Empoasca	Walsh	1862	viridescens	Walsh	1862
Chloria	Fieber	1866			
Chloroneura (in part)	Walsh	1862			
Kybos	Fieber	1866			
Chlorita	Fieber	1872			
Erythroneura	Fitch	1851	tricincta	Fitch	1851
Idia	Fieber	1866			
Zygina	Fieber	1866			
Aidola	Melichar	1914			
Eualebra	Baker	1899	smithii	Baker	1899
Eupteryx	Curtis	1833	atropunctata	Goeze	1778
Diomma	Motschoulsky	1863			
Typhlocyba (in part)	Germar	1833			
Heliona	Melichar	1903	constricta	Melichar	1903
Homa	Distant	1908	insignis	Distant	1908
Kahaono	Kirkaldy	1906	hanuala	Kirkaldy	1906
Molopopterus	Jacobi	1910	nigriplaga	Jacobi	1910
Motschulskyia	Kirkaldy	1905	inspiratus	Motschoulsky	1863
Conometopus	Motschoulsky	1863			
Nirvana	Kirkaldy	1900	pseudommatos	Kirkaldy	1900
Protalebra	Baker	1899	curvilinea	Gillette	1898
Typhlocyba	Germar	1833	quercus	Fabricius	1794
Anomia	Fieber	1866			
Empoa	Fitch	1851			
Zyginella	Löw	1885			
Typhlocybella	Baker	1903	minima	Baker	1903

large, deep punctures on the basal parts of tegmina. Melichar states that *Kybos* is a recognizable genus on the same character. In the writer's opinion this character is subject to intergradation to such an extent as to invalidate it for the separation of genera.

SYNOPSIS OF THE GENERA OF THE EUPTERYGIDAE.

A. Membrane appendiculate.
B. Wing with submarginal vein; apical wing cells 3. *Alebra.*
BB. Wing without submarginal vein; apical wing cells 3. *Protalebra.*
AA. Membrane not appendiculate.
C. Wing with submarginal vein.
*Apical wing cells 3.
D. Vertex shorter than pronotum *Eualebra.*
DD. Vertex twice as long as pronotum *Nirvana.*
**Apical wing cells 2.
E. More than one apical vein arising from cross-veins of tegmen *Dikraneura.**
EE. Only one apical vein arising from cross-veins of tegmen, it 3-parted *Kahaono.*
***Apical wing cell 1.
F. Margins of front not prominent *Empoasca.*†
FF. Margins of front prominent, united above.
G. Front not twice as long as wide, rounded above *Apheliona.*
GG. Front three times as long as wide, acute above *Heliona.*
CC. Wing without submarginal vein
*Apical wing cells 3; first two wing veins not confluent, joined by a cross-vein *Eupteryx.*
**Apical wing cells 2; first 2 wing veins confluent.
H. Fourth apical vein of tegmen curving to radial margin; second apical cell triangular usually stalked *Typhlocyba.*
HH. Fourth apical vein of tegmen paralleling radial margin ending in apical margin; second apical cell oblong, based on cross vein
I. Veins of tegmen thickened and conspicuous basally *Molopopterus*‡
II. Veins of tegmen invisible basally *Erythroneura.*§
***Apical wing cell 1.
J. Tegmen rounded apically *Dialecticopteryx?*
JJ. Tegmen angulate apically; second apical cell diamond-shaped *Typhlocybella.*

Summary of statistics as to genera.

Of the 33 generic names proposed for Eupterygidae, one in my opinion does not pertain to the family, and another may not. Of the remaining 31 names, 3 were preoccupied, and 12 are considered synonyms. In the purview of this paper, therefore, 16 generic names are held entirely valid; of which 9 were monobasic, and 7 had their type species subsequently assigned.

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* Sometimes with a so-called supernumerary cell, on outer apical margin of wing, nearly or quite enclosed. (*Notus*, *Erythria*.)

† *Homa* Distant, said to be related to *Empoasca*, differs from the other genera in this section by having the pronotum shorter than vertex.

‡ This is hardly the true systematic position of this genus, which is nearer the other Jassoidea in the venation of tegmen than any of the remaining genera of Eupterygidae. More probably it should be regarded as belonging to a different line of descent from groups B, BB, C, and CC, having the tegminal venation more primitive, and the wing venation comparatively much simplified, which we take to be an evidence of specialization.

§ The characters separating these genera, while much the same as those upon which Fieber established *Kybos* and *Chlorita* (now considered synonyms of *Empoasca*), seem to hold, especially that of the fourth apical vein. If found unstable, it will be necessary to range *Erythroneura* with all its synonyms under *Typhlocyba*, as done by Gillette. This would result in a series of seven synonymous names.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MUTANDA ORNITHOLOGICA.

IV.

BY HARRY C. OBERHOLSER.

This paper continues* the writer's comments on nomenclatorial alterations in the name of birds. Following are notes on the names of several species of euphonias.

Family TANAGRIDAE.

Euphonia vittata Sclater.

By the change of the generic term *Euphonia* to *Tanagra*, and the consequent alteration in the nomenclature of all the species in this group, the current names of several species and subspecies become untenable. By this transferrence to the genus *Tanagra*, the *Euphonia vittata* of Sclater† becomes preoccupied by *Tanagra vittata* Temminck‡, a synonym of *Pipraeidea melanonota* (Vieillot). As *Euphonia vittata* Sclater has apparently received no other name, it may be called *Tanagra catasticta*, nom. nov.

Euphonia aurea pileata Berlepsch.

When *Euphonia aurea pileata* Berlepsch§ becomes *Tanagra aurea pileata* (Berlepsch), it is ineligible for use on account of *Tanagra pileata* Gmelin‖ and *Tanagra pileata* Boddaert¶, both of which refer to the species now called *Nemosia pileata*. Since *Euphonia aurea pileata* Berlepsch has received no other name, it is necessary now to rechristen it,

* For the three previous papers, *cf.* Proc. Biol. Soc. Wash., XXX, March 31, 1917, pp. 75–76; Proc. Biol. Soc. Wash., XXX, July 27, 1917, pp. 125–126; and Proc. Biol. Soc. Wash., XXXI, May 16, 1918, pp. 47–49.

† Proc. Zool. Soc. Lond., 1861, p. 129 (Brazil).

‡ Nouv. Rec. Planch. Col. d'Ois., III, livr. 8, March, 1821, pl. XLVIII and text (Brazil).

§ Verh. V Internat. Ornith. Kongr. Berlin, 1910 (1911), p. 1014 (Quiribana de Caicara, Orinoco region, Venezuela).

‖ Syst. Nat., I, ii, 1789, p. 898 (Guiana and Brazil).

¶ Tabl. Planch. Enlum. d'Hist. Nat., 1783, p. 45 (Cayenne).

and we propose to call it *Tanagra aurea cynophora* Nobis. With this change the forms of *Tanagra aurea* will stand as follows:

Tanagra aurea aurea (Pallas).
Tanagra aurea violaceicollis (Cabanis).
Tanagra aurea cynophora Oberholser.

Euphonia violacea magna Berlepsch.

The transferrence of the generic name *Tanagra* to *Euphonia violacea magna* Berlepsch* renders this subspecific name untenable on account of the prior *Tanagra magna* Gmelin,† which is now *Saltator magnus* (Gmelin). Since *Euphonia violacea magna* Berlepsch must therefore be renamed, it may be known as *Tanagra violacea pampolla*, nom nov. The forms of *Tanagra violacea* are as follows:

Tanagra violacea violacea (Linnaeus).
Tanagra violacea aurantiicollis (Bertoni).
Tanagra violacea pampolla Oberholser.

Euphonia laniirostris peruviana Berlepsch and Stolzmann.

Since *Euphonia laniirostris peruviana* Berlepsch and Stolzmann‡ must have *Tanagra* for its generic name, it must also have a new subspecific term, as in the combination *Tanagra laniirostris peruviana* it is ineligible on account of *Tanagra peruviana* Desmarest§, which is now *Tangara peruviana* (Desmarest), the species formerly called *Calospiza melanota* (Swainson). As no subspecific name is now found available for *Euphonia laniirostris peruviana* Berlepsch and Stolzmann, it may be called *Tanagra laniirostris zopholega*, nom. nov. The forms of this species are as follows:

Tanagra laniirostris laniirostris (D'Orbigny and Lafresnaye).
Tanagra laniirostris zopholega Oberholser.

Euphonia olivacea Desmarest.

The *Euphonia olivacea* of Demarest,‖ when used in combination with the generic name *Tanagra*, is preoccupied by *Tanagra olivacea* Gmelin,¶ which is probably the same as *Piranga erythromelas* (Vieillot). The proper name for the species will therefore become *Tanagra minuta* (Cabanis).**

* Verh. V Internat. Ornith. Kongr. Berlin, 1910 (1911), p. 1018 (Blumenau, Sta. Catharina, Brazil).

† Syst. Nat. I, ii, 1789, p. 890 (Guiana and Cayenne).

‡ Ornis, XIII, part 2, September, 1906, p. 77 (La Merced, central Peru).

§ Hist. Nat. Tangaras, 1805, pl. XI (Peru).

‖ Hist. Nat. Tangaras, 1805, pl. XXVII.

¶ Syst. Nat., I, ii, 1789, p. 889 (Cayenne and New York).

** *E*[*uphona*]. [sic] *minuta* Cabanis, in Schomburgk's Reis. Brit.-Guiana, III, 1848, p. 671 (British Guiana).

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PROCEEDINGS

OF THE

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TWO NEW SHREWS FROM OREGON.

BY HARTLEY H. T. JACKSON.

The Biological Survey Collection contains several specimens of two undescribed shrews from western Oregon. One of these forms is a species similar to *Sorex pacificus* Coues, with which it has long been confused. The other is a subspecies of *obscurus*, and is intermediate in some respects between *Sorex obscurus setosus* Elliot and *Sorex obscurus bairdi* Merriam. They may be identified by the following description :

Sorex yaquinae, sp. nov.

Type, adult ♀, skin and skull, No. 73,051, U. S. National Museum, Biological Survey Collection, from Yaquina Bay, Oregon; collected July 18, 1895, by B. J. Bretherton. Original number 2031.

General characters.—In color and general appearance much like *Sorex pacificus*, but smaller and with shorter tail and feet. Skull decidedly smaller in all dimensions than that of *pacificus*, with weaker rostrum, noticeably shorter tooth row and relatively smaller dentition, particularly second maxillary premolar; dental pigmentation darker than in *pacificus*. Decidedly larger than *Sorex obscurus bairdi*, which it resembles somewhat in color; skull larger and rather flatter than that of *bairdi*, with heavier dentition, particularly prominent in the unicuspidate teeth and first incisors.

Color.—*Winter pelage:* Upperparts in general effect mummy brown* or fuscous, tending slightly toward fuscous-black, paling almost imperceptibly on the head and face; color of back continuing well down on the sides and grading into color of underparts. Underparts slightly paler than upperparts, near olive-brown or slightly darker; tail indistinctly bicolor, hair-brown or drab above, light drab or avellaneous below; feet and tarsi avellanous. *Summer pelage:* Distinctly more reddish than in winter. Upperparts between Prout's brown and cinnamon brown, some-

* Ridgway, R., Color standards and color nomenclature, 1912.

times inclining toward sepia. Underparts paler; near snuff brown, usually between snuff brown and Saccardo's umber; tail and feet about as in winter.

Skull.—In general outline suggesting that of *Sorex pacificus* but much smaller in all dimensions. Compared with that of other (than *pacificus*) American *Sorex* rather large; braincase broad and moderately flat; rostrum medium; interorbital region rather elongate, somewhat depressed; dentition heavy, rather deeply but not extensively pigmented; second unicuspid slightly larger than first, the third much smaller than fourth, which is somewhat smaller than first, the fifth the smallest.

Measurements.—Type (adult female): Total length, 137; tail vertebrae, 59; hind foot, 16. *Skull:* Type (adult female; teeth slightly worn): Condylobasal length, 20.7; palatal length, 8.3; breadth of cranium 9.7; interorbital breadth, 4.3; maxillary breadth, 5.9; maxillary tooth row (anterior edge of second upper incisor to posterior edge of last upper molar measured at alveolar border), 7.6.

Remarks.—Specimens of *Sorex yaquinae* have been examined from Yaquina Bay, Gardiner, Mapleton, and Vida, all localities in Oregon west of the Cascade Mountains and north of the Umpqua River. At Gardiner, Oregon, *Sorex yaquinae* apparently occurs with *Sorex pacificus*, specimens of both species having been seen from there. The two shrews, however, in spite of general similarities, seem to be entirely distinct and are easily separated in the material available. On the other hand, although *yaquinae* occurs with *Sorex obscurus bairdi* at Vida, Oregon, the differences between these two forms is not so clearly marked and it is possible that additional specimens will show specific affinity between *bairdi* and *yaquinae*.

Sorex obscurus permiliensis, subsp. nov.

Type, adult male, skin and skull, No. 91,048, U. S. National Museum, Biological Survey Collection, from Permilia Lake, west base of Mount Jefferson, Cascade Range, Oregon; collected October 2, 1897, by J. A. Loring. Original number 4756.

General characters.—About the size of *Sorex obscurus setosus* with, on the average, slightly shorter tail; decidedly more reddish in summer pelage than *setosus*; skull essentially the size of that of *setosus* (possibly averaging slightly longer), with broader braincase, unicuspidate teeth (particularly anterior two) somewhat heavier and posterior margins of molariform teeth usually more emarginate. Slightly smaller than *Sorex obscurus bairdi*, with actually and relatively smaller feet, and rather paler coloration; skull smaller than that of *bairdi*, with shorter palate, and decidedly weaker dentition.

Color.—Winter pelage: Upperparts slightly darker than hair-brown, sometimes approaching chaetura drab, extending, very slightly paler, well down on sides; color of underparts in winter pelage unknown. *Summer pelage:* Upperparts most nearly between snuff brown and sepia, or slightly more yellowish than olive brown, between Saccardo's umber

and olive-brown, paling very slightly on the sides and grading into color of underparts; underparts slightly paler than back, usually between buffy brown and tawny-olive, sometimes tending toward avellaneous; tail scarcely bicolor; above about same color as back, becoming very slightly paler below.

Skull.—Large for the species *obscurus*, somewhat smaller than that of *Sorex obscurus bairdi*, slightly larger than that of *setosus*, and much larger and heavier than that of *Sorex obscurus obscurus;* braincase broad, slightly flattened; rostrum relatively rather long and wide; interorbital region somewhat elongate, not much depressed; dentition moderately heavy, with intense and moderately extensive pigmentation.

Measurements.—Type (adult male): Total length, 117; tail vertebrae, 51; hind foot, 14. *Skull:* Type (adult male; teeth slightly worn): Condylobasal length, 17.9; palatal length, 7.2; breadth of cranium, 8.8; interorbital breadth, 3.7; maxillary breadth, 5.2; maxillary tooth row (anterior edge of second upper incisor to posterior edge of last upper molar measured at alveolar border), 6.4.

Remarks.—The series of seventeen specimens of *Sorex obscurus permiliensis* from the type locality was collected during the first week of October, 1897. Three of these specimens are in worn summer pelage; the others, including the type, are in various stages of transition from summer to winter pelage; none has acquired the full winter coat. Specimens have also been examined from Mount Hood and Detroit, Oregon. The Detroit specimen shows in some respects an approach toward *bairdi.* Intergradation with *Sorex obscurus setosus* seems to be indicated in a specimen of *setosus* from Conrad Meadows, Yakima County, Washington.

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SIX NEW SPECIES OF TREES AND SHRUBS FROM MEXICO.

BY PAUL C. STANDLEY.*

Of the six new species described in the present paper, three belong to the genus *Vauquelinia*, of the family Rosaceae, a group essentially Mexican in its distribution, although two of its representatives extend into the southwestern United States. One of the species described was indicated as new some years ago by Mr. J. H. Painter, formerly Aid in the U. S. National Herbarium.

Two of the new species belong to *Odostemon*, for which the later name *Mahonia* is often used, a genus formerly referred to *Berberis*, but now commonly regarded as distinct. The last plant described is a *Deutzia*, of the family Hydrangeaceae, the third species to be reported from America. The genus is well represented in eastern Asia, and some of its species are common in cultivation.

Vauquelinia potosina Painter, sp. nov.

Branchlets tomentulose or finally glabrate; petioles 0.8–2.5 cm. long; leaf blades narrowly oblong, 6–10.5 cm. long; 1–2.2 cm. wide, obtuse or acutish at the base, acutish or obtuse at the apex, closely serrate, glabrous, green and lustrous on the upper surface, slightly paler beneath; corymbs many-flowered, 4–7 cm. broad; calyx glabrous outside or nearly so, the lobes ovate-oval, acutish, tomentose within on the margins; petals broadly oval, 3.5 mm. long; fruit densely tomentose.

Type in the U. S. National Herbarium, no. 570101, collected at Alvárez, San Luis Potosí, Mexico, May, 1905, by Edward Palmer (no. 594). Collected also at Bagre, in the same State, in June, 1911, by C. A. Purpus (no. 5207).

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Related to both *V. corymbosa* Correa and *V. karwinskyi* Maxim. The former differs in its narrow, long-petiolate leaves, whose blades are very acute or attenuate at the base; and the latter is distinguished by its very broad leaves with blades truncate or very obtuse at the base.

Vauquelinia angustifolia Rydb. was published in 1908* as a segregate from *V. corymbosa*. It is said to be distinguished from the latter by its shorter petioles and the presence of pubescence on the interior surface of the hypanthium. Examination of material of both species convinces the present writer that there is no essential difference between them. The length of the petioles exhibits great variation upon a single plant, and the hypanthium is always sericeous within. Material from Hidalgo, the type locality, differs somewhat from the original illustration of *V. corymbosa*, but not essentially, apparently. This species was reported by Rydberg only from Mexico, but there is a specimen in the National Herbarium collected somewhere in western Texas by V. Havard in 1880.

Vauquelinia australis Standley, sp. nov.

Branchlets finely but loosely tomentulose; petioles 5–8 mm. long; leaf blades narrowly elliptic-oblong, 3.5–6 cm. long, 1–1.6 cm. wide, acute or acutish at the base, rounded or very obtuse at the apex and mucronate, finely serrulate, green and lustrous on the upper surface, glabrous or sparsely tomentulose, pale beneath with a fine yellowish tomentum; corymbs many-flowered, 3.5–4 cm. broad, short-pedunculate; calyx sparsely tomentulose outside, the lobes ovate-oval, acutish; petals suborbicular, 3.5 mm. long.

Type in the U. S. National Herbarium, no. 840627, collected on Cerro de Paxtle, vicinity of San Luis Tultitlanapa, Puebla, Mexico, April, 1908, by C. A. Purpus (no. 2729a).

The only other species with a persistent tomentum on the lower surface of the leaves is *V. californica*, but in that the leaves are larger, more narrowed at the apex, on much longer petioles, and with a very fine and dense white tomentum.

Vauquelinia pauciflora Standley, sp. nov.

Tree; branchlets finely and rather loosely tomentulose; petioles 3–6 mm. long; leaf blades narrowly lance-oblong, 3–4 cm. long, 6–11 mm. wide, obtuse or acutish at the base, somewhat narrowed to the acute or acutish apex, finely serrulate, lustrous above, sparsely tomentulose, glabrous beneath when expanded but probably tomentulose when young; corymbs few-flowered (flowers 10 or fewer), nearly sessile, the flowers short-pedicellate; fruit densely tomentose.

Type in the U. S. National Herbarium, no. 234626, collected in Guadalupe Canyon, northeastern Sonora, Mexico, altitude 1380 meters, October 3, 1893, by E. A. Mearns (no. 2535). Obtained at the same locality, Aug. 28, 1893, by E. C. Merton (no. 2063).

*N. Amer. Fl. **22**: 260.

Guadalupe Canyon is on the border between Sonora and New Mexico. In the flora of New Mexico* the writer reported this plant from that State as *V. californica* (Torr.) Sarg., upon the basis of Dr. Mearns' published notes. Upon examination of the specimens, however, it is evident that the Sonoran plant is different from that species, which occurs farther west. In *V. californica* the lower surface of the leaves is covered with a fine, close, persistent, white tomentum, the leaves are much larger, the petioles twice as long or longer, and the inflorescence broad and many-flowered.

Odostemon longipes Standley, sp. nov.

Branches dark gray or blackish; leaves 20–30 cm. long, the rachis very slender, somewhat flexuous, glaucescent, the leaflets usually 11 or 13, distant, sessile or the lowest short-petiolate, the upper ones slightly smaller than the lower, the lowest pair borne 4–5.5 cm. from the base of the rachis; leaflets narrowly oblong, lance-oblong, or ovate-oblong, 3.2–5.5 cm. long, 0.8–2 cm. wide, acute or acutish at the base, rounded or obtuse at the apex, mucronulate, entire, subcoriaceous, glabrous, dull, pale green above, glaucescent beneath, the venation prominent and finely reticulate on both surfaces; flowers racemose, the racemes 15–22 cm. long, long-pedunculate, the rachis very slender, the flowers few, remote, the pedicels slender, glaucescent, 1.5–2 cm. long; fruit subpyriform, about 1 cm. long, very glaucous; seeds obovoid, compressed, about 7 mm. long and 3.5 mm. wide, dark brown, dull.

Type in the U. S. National Herbarium, no. 571119, collected at San Ramón, Durango, Mexico, in 1906, by Edward Palmer (no. 103).

Related to **O. chococo** (Schlecht.) † but in that species the pedicels are usually less than half as long, and the leaflets deep green, very lustrous on the upper surface, and with less prominent venation. The present species is a large shrub or small tree, for a section of the bright yellow wood is 7.5 cm. in diameter.

Odostemon quinquefolius Standley, sp. nov.

Large shrub, glabrous throughout; leaves 9–15 cm. long, the rachis stout, the leaflets 5, distant, subequal, sessile, the lowest pair borne 3–4.5 cm. from the base of the rachis; leaflets oblong-ovate to ovate-oval, 3–5.3 cm. long, 1.5–4 cm. wide, rounded or broadly cuneate at the base, obtuse or acutish at the apex, coarsely dentate, with 7–10 large spreading spine-tipped teeth on each side, coriaceous, green, lustrous, the venation prominent and finely reticulate on both surfaces; inflorescence racemose, the racemes 7-11 cm. long, long-pedunculate, densely many-flowered, the rachis stout, the pedicels 2–5 mm. long, furnished with 2 small bractlets near the middle, the bracts small, ovate-acuminate; outer sepals small, oval, acute, the inner ones oval, obtuse; stamens bidentate.

Type in the U. S. National Herbarium, no. 841065, collected on the

* Contr. U. S. Nat. Herb. **19**: 321. 1915.

† *Berberis chococo* Schlecht. Bot. Zeit. **12**: 652. 1854.

Cerro Matzize, vicinity of San Luis Tultitlanapa, Puebla, Mexico, July, 1907, by C. A. Purpus (no. 2775).

Purpus's no. 2774, from the Cerro de Paxtle, in the same region, also appears to be of this species, differing only in the somewhat larger leaflets with broader apices.

In Fedde's monograph of the genus *Mahonia** this plant would fall near *M. andrieuxii* (Hook. & Arn.) Fedde, a species in which the leaflets have numerous small appressed teeth. *Odostemon quinquefolius* seems to belong rather with *M. zimapana* and the related species, all of which, however, have more numerous leaflets.

Deutzia occidentalis Standley, sp. nov.

Shrub, sometimes 4.5 meters high; branchlets brownish, finely stellate-pubescent; petioles 2.5–7 mm. long; leaf blades lanceolate or ovate, 2–4.5 cm. long, 0.8–2 cm. wide, rounded or obtuse at the base, narrowed to the acute or obtuse apex, green on the upper surface, very rough with fine stellate hairs, grayish-white or yellowish-white beneath, with a dense covering of loose stellate hairs, some of the hairs sessile and some stipitate, the margins of the blades finely and unequally dentate, the venation impressed on the upper surface but prominent beneath; corymbs many-flowered, 2.5–5 cm. wide, the flowers mostly slender-pedicellate; calyx densely stellate-pubescent, the lobes ovate-oval, 1.5–2 mm. long, obtuse or acutish; petals 3–4 mm. long; stamens 12–15, the filaments slender, entire.

Type in the U. S. National Herbarium, no. 841336, collected in the Barranca del Oro, Puebla, Mexico, altitude 2100 to 2400 meters, August, 1909, by C. A. Purpus (no. 3970).

Additional specimens examined: Cerro de Gachupín, Puebla, *Purpus* 3924. Sierra de San Felipe, Oaxaca, alt. 900 meters, *Pringle* 4691. Near Reyes, Oaxaca, alt. 200 to 300 meters, *Nelson* 1810.

The last collection cited may represent a different species, for the leaves are much larger and broader than in the other specimens cited.

Two other species of *Deutzia* have been described from Mexico, *D. mexicana* Hemsl. and *D. pringlei* Schneid. Most of the representatives of the genus occur in eastern Asia, and for the American ones Small† proposed a new genus, *Neodeutzia*. The separation is based upon the fact that the Mexican specimens have slender entire filaments, rather than broad bidentate ones. Since the latter character is not constant in the Asiatic species, it seems better to refer the American plants, also, to *Deutzia*. *Neodeutzia ovalis* Small‡ is a synonym of *Deutzia pringlei* Schneid§, both having been described from the same collection.

The two earlier Mexican species of *Deutzia* differ from *D. occidentalis* in the very fine, close pubesence of the lower surface of the leaves, this composed of similar rather than unequal hairs.

* Bot. Jahrb. Engler **31**: 30-133. 1901.

† N.Amer. Fl. **22**: 161. 1905.

‡ N. Amer. Fl. **22**: 162. 1905.

§ Mitt. Deutsch. Dendr. Ges. **1904**: 186. 1904.

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A NEW MARINE MOLLUSK OF THE GENUS CERITHIOPSIS FROM FLORIDA.*

BY PAUL BARTSCH.

Among a lot of shells transmitted to the U. S. National Museum for determination, by Mr. T. Van Hyning, Director of the Florida State Museum, is a minute species of *Cerithiopsis* which requires a name, and I take pleasure in designating it:

Cerithiopsis (Cerithiopsis) vanhyningi, new species.

Shell very small, very elongate ovate. Nuclear whorls 3¼, well rounded, smooth, forming a mucronate white apex. Postnuclear whorls chestnut brown, the early ones a little lighter than the last, darkest on the base, the first marked by two slender spiral cords, of which the first is a little anterior to the summit, and the second decidedly posterior to the suture. Beginning with the second postnuclear whorl, a slender spiral thread makes its appearance between the other two, a little nearer to the posterior than the anterior; in fact, it is so close to the posterior that the nodules on the later turns have a dumb bell shaped aspect. This spiral thread gains rapidly in strength, equaling the posterior cord on the third turn. In addition to the spiral sculpture, the whorls are marked by axial ribs which begin as very slight threads and increase rapidly in size with the growth of the shell. The junctions of the axial ribs and the spiral cords form strong tubercles. Those on the posterior and median cord are well rounded and separated only by a slender impressed line on all the whorls except the last, where they are more distantly spaced. Those of the anterior cord are slightly truncated posteriorly, and slope gently anteriorly. The spaces enclosed between the two ribs and spiral cords are strongly impressed rounded pits. Suture weakly channeled. Periphery of the last whorl marked by a strong spiral cord, which is not crossed by the continuation of the axial ribs. The insertion of the columella is surrounded by a strong

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basal fasciole midway between which and the peripheral cord a third strong spiral cord is present. The peripheral cord and the median cord are of equal width and are separated by a deep incised channel which equals that separating the basal fasciole from the median cord. Aperture irregular, strongly channeled anteriorly; posterior angle obtuse; outer lip thin at the edge, decidedly sinuous; inner lip reflected and appressed at the base.

The type and three specicimens of this species, Cat. No. 21907, U. S. N. M., were collected by Mr. D. W. Wright, in old Tampa Bay, Fla. The type has lost the nuclear whorls. The eight postnuclear whorls remaining measure: length, 3 mm.; diameter, 1.1 mm. Seven paratypes from the same station are in the Florida State Museum.

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CHANGES IN AND ADDITIONS TO MOLLUSCAN NOMENCLATURE.

BY WILLIAM HEALEY DALL.

In a paper ready for the printer, but which may be considerably delayed in publication, the following changes in nomenclature occur, which it is thought best to publish at the present time.

Tromina new genus, type *Fusus unicarinatus* Philippi, from the Magellanic area.

Neptunea Bolten. I showed in 1902 that after deducting properly proposed genera from the heterogeneous assembly included under this name by Bolten, the remaining portion which would keep the name was typified by *Trophon clathratus* upon which G. O. Sars later founded his genus *Boreotrophon*.

The genus *Littorina* typified by *T. littoralis* beside the typical section is divisible as follows: Section **Algaroda** Dall, type *L. litorea* L.; Section **Littorivaga** Dall, type *L. sitchana* Philippi; and the following subgenera: *Melaraphe* (Muhlfeldt) Menke, 1828, type *L. neritoides* L.; and subgenus **Algamorda** Dall, type *L. newcombiana* Hemphill.

Boetica new genus, is proposed for **B. vaginata** Dall, a small shell resembling conchologically a very solid *Lacuna* but with a sulcus at the posterior commissure of the aperture and one like that of *Trichotropis* anteriorly; the surface smooth, but the operculum unknown. Habitat: San Diego, Cal., in 199 fathoms.

Isapis Adams, 1853, being preoccupied by Westwood in 1851, **Iselica** is proposed as a substitute.

Elachisina (**grippi** Dall) new genus and species, is proposed for a minute shell resembling a short *Cingula* in form with fine sharp spiral striae over the whole shell giving the aspect of a small littoriniform *Eunaticina*. San Diego, Cal., in 20 fathoms.

Kurtziella, new section of *Mangilia*, type *Pleurotoma cerina* Kurtz and Stimpson. Atlantic coast.

Progabbia, new subgenus for west American Cancellarias, type *Cancellaria cooperi* Gabb, with a new section, **Crawfordia,** for species of the type of *Cancellaria crawfordiana* Dall.

Boreomelon, new subgenus of *Fulgoraria*, type *Scaphella stearnsii* Dall, Alaska.

Phenacoptygma, new genus of *Volutidae*, type *Surculina cortezi* Dall, California.

Atrimitra, new subgenus of *Strigatella*, for the black Pacific coast Mitras, type *Mitra idae* Melvill.

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THE LIP-FERNS OF THE SOUTHWESTERN UNITED STATES RELATED TO CHEILANTHES MYRIOPHYLLA.*

BY WILLIAM R. MAXON.

Under the names *Cheilanthes myriophylla* Desv., *C. Clevelandii* D. C. Eaton, and *C. Fendleri* Hook., but chiefly under the first, there have been associated in herbaria for many years several species whose distinctive characters have been so little observed or correlated that identical material has been variously labelled and the whole complex has been regarded either as hopelessly confused or as representing two or three species of inordinate variation. An extreme view of the situation was given definite expression by D. C. Eaton, who wrote in the Botany of the Death Valley Expedition as follows:

"I find it impossible to distinguish between *C. myriophylla* and *C. Fendleri*. Specimens which I had at one time called *C. Fendleri* I afterwards referred to *C. myriophylla*, and Mr. Davenport again placed in *C. Fendleri*. Even Mr. Faxon's carefully drawn figures in the Ferns of North America (t. lxxix) do not show the differences which I thought I could discern when that book was written, and I am persuaded that *C. myriophylla* is a fern which represents a multitude of varying forms, connected by all degrees of intermediate conditions, which it is not worth while to try to separate, even into named varieties."†

Others, who have been familiar with one or more of the forms in the field and have noted their peculiar characters, have

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† Contr. U. S. Nat. Herb. **4**: 227. 1893.

tacitly doubted the correctness of this conclusion, but there has been no critical study of the group as a whole. In particular, the common plant of southern California, passing for the most part as *C. myriophylla*, has long been known to depart widely from current descriptions of this species. More recently this discrepancy has again been brought to the writer's attention by Mr. George L. Moxley, and by several other California botanists quite independently, and the present paper has resulted from an effort to clear up the existing confusion in the whole series of related or misidentified forms occurring in the southwestern states. The conclusions reached are altogether at variance from Eaton's judgment above quoted, but are in the main satisfactory and appear to be fully substantiated by the great amount of herbarium material now available.

The facts appear to be, briefly, that *C. myriophylla*, an andine species of North and South America, does not extend north of Mexico and must be excluded from the United States flora; that *C. villosa* Davenp., of the Mexican Border region, is a nearly related but well defined species; that the plant of southern California and adjacent territory represents a variable undescribed species (*C. Covillei*), including a northern, mainly coastal form which further study and material may show to be specifically distinct; and that the southwestern plants referred mostly to *C. Fendleri* actually pertain to two species, *C. Fendleri* and an undescribed species (*C. Wootoni*), similar in general habit but easily recognizable upon characters of the scaly covering of the under surface.

The distinguishing characters of these species and of *C. Clevelandii*, which has sometimes been confused with *C. Covillei*, are given in the accompanying descriptions and key. For the purposes of the present paper it is not necessary to deal critically with *C. myriophylla*, which, excluding the United States plants heretofore so referred, is taken in its traditional sense. Thus restricted, *C. myriophylla* is still a variable species, possibly comprising several forms worthy of separation. The tropical material at hand is ample and will serve as the basis of a later paper. Its segregation does not affect the status of species occurring within the United States.

Rhizome decumbent to suberect, massive, nodose or multicipital, with tufted scales; upper surface of the segments of the lamina hairy, devoid of scales.

Stipes densely clothed with very slender appressed scales; segments of the lamina bearing a few weak, tortuous, moniliform hairs above, these lightly attached. . . . 1. *C. myriophylla.*

Stipes bearing numerous large, oblong, whitish, spreading scales, in addition to the linear to filiform, appressed or ascending scales characteristic of the group; segments of the lamina rather densely villous above, the hairs coarse, widely curved and flexuous, tortuous, distantly and obscurely septate, persistent. . . . . 2. *C. villosa.*

Rhizome creeping (usually widely so), with few to numerous short, mostly slender branches, the scales imbricate, closely appressed to loosely secund; upper surface of the segments devoid of hairs, in no. 5a bearing a few minute, pale, subpersistent, stellate scales.

Scales of the under side of the lamina nonciliate, oblique, loosely imbricate, not always covering the segments. . 3. *C. Fendleri.*

Scales of the under side of the lamina invariably long-ciliate (at least in the basal part), widely imbricate, wholly covering the segments.

Rhizome deciduously paleaceous, the scales relatively broad, acutish to long-acuminate, membranaceous, usually pale brown and concolorous, the middle portion never strongly sclerotic; scales of the lamina beneath firmly attached at the subcordate to cordate base. 4. *C. Wootoni.*

Rhizome persistently paleaceous, the scales linear to lance-attenuate, rigid, bright brown to blackish, strongly sclerotic throughout or toward their apex; scales of the lamina beneath lightly attached above the closed sinus of the deeply cordate base, the lobes overlapping.

Fronds many, closely placed upon the numerous short, sometimes thickish branches of the rhizome, these often close and intricate; segments roundish or irregularly oval.

Segments devoid of scales above; scales of the lamina beneath whitish to pale castaneous, large, much exceeding the segments. . . . . 5. *C. Covillei.*

Segments bearing a few minute, pale, stellate scales above; scales of the lamina beneath bright castaneous to cinnamomeous, narrower, more numerous, mostly not exceeding the segments, many of them minute, very copiously ciliate, entangled, forming a loose tomentum. 5a. *C. Covillei intertexta.*

Fronds few, larger, with stouter, lighter-colored stipes, spaced (5–10 mm. apart), the rhizome relatively more slender, with a few short, slender branches; segments of the lamina prevailingly subcordate-orbicular. . . . . 6. *C. Clevelandii.*

1. Cheilanthes myriophylla Desv. Ges. Naturf. Freund. Berlin Mag. **5:** 328. 1811.

Cheilanthes elegans Desv. Ges. Naturf. Freund. Berlin Mag. **5:** 328. 1811.

Cheilanthes paleacea Mart. & Gal. Nouv. Mém. Acad. Sci. Brux. **15:** 76. *pl. 21, f. 2.* 1842.

Viewed in the sense above mentioned, *Cheilanthes myriophylla* is a variable species occurring rather commonly in mountain regions from Argentina and Bolivia to northern Mexico. The numerous specimens from these regions show general agreement in the following characters:

Rhizome massive, decumbent or suberect, usually multicipital, the divisions short, nodose; fronds closely fasciculate, tall, stiffly erect; stipes very densely appressed-paleaceous, the scales exceedingly numerous, very narrow, conform, persistent, closely investing the stipe: lamina 3–4-pinnate, densely paleaceous beneath, the scales variable, the larger ones of an ovate type, very firmly attached at the elevated, deeply cordate base, acuminate to attenuate at the apex, nonciliate, subentire to strongly erose-dentate; numerous reduced scales of the under surface and rachises tortuous, filiform, recurved among the segments and partially overlying their upper surface; segments minute, beadlike, sessile or short-stalked, bearing a few tortuous, weak, moniliform hairs above, these lightly attached, readily abraded; sporangia borne well within the deeply concave or cucullate rounded outer border of the segment, the broad margin commonly bilobed and crenate, with paler and thinner edges. Leaf tissue dull green, herbaceous.

These characters denote a close relationship with *C. villosa* only, with which species it is contrasted in the key. The original specimens of *C. myriophylla* are said by Desvaux to have come from South America, the particular region not being indicated.

2. Cheilanthes villosa Davenp. Cat. Davenp. Herb. Suppl. 45. 1883.

Rhizome ascending or decumbent, massive (1–3 cm. in diameter), nodose or multicipital, the few branches close, short, and thick (5–10 mm. in diameter), coarsely radicose, densely paleaceous, the scales tufted (especially at the apices), narrowly subulate-attenuate, 5–9 mm. long, 0.5 mm. broad or less at the base, strongly falcate, flexuous in the apical half, with a narrow, opaque, strongly sclerotic, dark brown median band nearly throughout, the delicate translucent whitish borders with a few distant, low, minute, rounded teeth. Fronds numerous, erect, dorsal, fasicculate (often appearing subcespitose), 10–33 cm. long; stipe 4–14 cm. long, 0.7–1.5 mm. in diameter, subflexuous, purplish brown, with a nearly persistent covering of minute, appressed, linear scales and numerous large, oblong, white or pale tawny, spreading scales; lamina

linear-oblong or narrowly oblong-lanceolate, acuminate, 6–23 cm. long, 2–5 cm. broad, tripinnate, the larger tertiary segments ternately (rarely pinnately) divided; rachis similar to the stipe, copiously paleaceous; pinnae numerous, mostly alternate, adjacent (or several lower pairs distant), ascending, upwardly falcate and involute in drying, mostly deltoid-oblong, the lower and especially the basal ones rather broadly deltoid and strongly inequilateral; secondary and tertiary rachises copiously paleaceous beneath, the scales very large, nearly covering the pinnae, whitish or pale tawny with a darker base, ovate, acuminate to long-acuminate, attached at the cordate base (the sinus commonly closed, with overlapping lobes), erose-denticulate, translucent, the cells very irregular, with deeply sinuous partition walls; tertiary segments simple and spatulate to cuneate-obvate, or the larger ones mostly divided into 3 segments, the terminal one larger and more strongly cuneate; ultimate segments in general minute, beadlike, close, glabrous beneath, rather densely villous above, the hairs very coarse, flattish, curved and somewhat flexuous, tortuous, yellowish-hyaline, distantly and obscurely septate; sporangia few, borne within the deeply recurved or cucullate, bilobed border of the segment above the cuneate base, the slightly modified margin a little thinner and paler. Leaf tissue grayish green, herbaceous, minutely papillose, wrinkled in drying.

This rare and strongly marked plant was first brought to notice by Davenport, who recognized its relationship to *C. myriophylla* and regarded it as a "provisional new species," basing his exceedingly brief and rather misleading description upon specimens collected in southeastern Arizona by Lemmon in September, 1881. Through the kindness of Mr. William P. Rich, Custodian of the Davenport Herbarium of the Massachusetts Horticultural Society, the writer has been able to examine a portion of the type specimen. This agrees closely in all particulars with specimens collected on limestone ledges in the Santa Rita Mountains of Arizona, by C. G. Pringle, May 14, 1884, and widely distributed among herbaria as "*Cheilanthes myriophylla* Desv. (True!)." The agreement is, in fact, so complete that for all practical purposes the latter, generally available collection may be regarded as equivalent to the type.

In its stout, ascending or decumbent rhizome, very long, slender, strongly sclerotic rhizome scales, and conspicuously villous upper leaf surfaces *C. villosa* differs markedly from *C. Fendleri* and *C. Wootoni*, and, except for the sclerotic character of its more elongate rhizome scales, equally from *C. Covillei*. In most respects it is much nearer *C. myriophylla*, but from that it differs strongly in the points stated in the key.

The following specimens of *Cheilanthes villosa* are in the National Herbarium.

Arizona: Conservatory Canyon, Huachuca Mountains, Aug., 1882, *Lemmon;* Santa Rita Mountains, on limestone ledges, May 14, 1884, *Pringle* (labelled *C. myriophylla*, "True!" 4 sheets).

New Mexico: Hanover Mountain, Grant County, Aug. 9, 1911,

Holzinger; Big Hatchet Mountains, Grant County, *Mearns* 224; North Percha Creek, south end of Black Range, alt. 1800 meters, on limestone, *Metcalfe* 952; Bishop's Cap, Organ Mountains, Oct. 21, 1906, *Wooton & Standley.*

Texas: El Paso, *Mearns* 231, *Stearns* 215; near Sierra Blanca, *Rose, Standley & Russell* 12238a.

Mexico: Santa Eulalia Mountains, Chihuahua, July 30, 1885, *Wilkinson;* Sierra Mojada, Coahuila, *Jones* 532.

3. Cheilanthes Fendleri Hook. Sp. Fil. **2:** 103. *pl. 107. B.* 1852.

Rhizome epigean, wide-creeping (5–12 cm.), slender (1–2 mm. in diameter), simple or with a few, usually short branches, terete, often flexuous, light brown, subpersistently paleaceous, the scales loosely imbricate, secund, narrowly ovate, long-acuminate to attenuate, 2–2.5 mm. long, 0.6–0.8 mm. broad, straight or falcate, entire, membranaceous, translucent, very pale brown, concolorous or nearly so. Fronds several, erect, distichous, evenly spaced about 1 cm. apart or often subfasciculate at the ends of the branches, 8–30 cm. long; stipe 0.4–1.2 mm. in diameter, 3–18 cm. long, somewhat flexuous above the arcuate base, brownish-castaneous, sublustrous, persistently paleaceous, the numerous scales pale, linear-attenuate to filiform, mostly small, ascending or subappressed; lamina narrowly oblong-lanceolate to ovate-lanceolate, acuminate, 5–14 cm. long, 2–3.5 cm. broad, tripinnate, the tertiary segments simple to ternately cleft or divided; rachis similar to the stipe; pinnae contiguous to distant, mostly alternate, oblique, subarcuate, for the most part narrowly oblong to elongate-triangular and acuminate, the largest ones more broadly triangular or sometimes ovate-triangular, strongly inequilateral (broader below); secondary and principal tertiary rachises bearing numerous spreading loosely imbricate scales beneath, these relatively large, variable in number and disposition, usually exceeding the segments, partially or sometimes wholly concealing them, tawny to light reddish brown, paler toward the margin, oblique, firmly and rather broadly attached at the rounded or subcordate base, ovate and long-acuminate to ovate-lanceolate and long-attenuate, denticulate, not at all ciliate, the cells irregularly elongate, with sinuous partition walls; segments close or usually distant, mostly oblique, broadly rounded-obovate to cuneiform, the terminal ones the largest, these strongly cuneate and obliquely cleft, the largest basal ones also sometimes 2–3-cleft or divided; sporangia few, large, borne within the strongly recurved apical border of the segments or its lobes, the margin slightly modified. Leaf tissue rigidly herbaceous, bright green, minutely papillose, glistening.

Cheilanthes Fendleri was founded on specimens collected "somewhere about Santa Fe,"* New Mexico, in 1847, by A. Fendler (no. 1015). The original collection is missing from the National Hebarium; but of the two closely related species of the Mexican Border region heretofore confused under this name the description points rather plainly to the plant with nonciliate scales, and as the Gray Herbarium specimen agrees,

* Standley, Contr. U. S. Nat. Herb. **13:** 175. 1910.

it seems safe to apply the name in this sense. The plant with ciliate scales is regarded as a new species, *C. Wootoni.*

The differences distiguishing *C. Fendleri* and *C. Wootoni* are stated in the key, and are further mentioned under the latter species. The ranges of the two overlap, but *C. Fendleri* is the more widespread and, apparently, far the commoner. Occasionally, as in the Burro and Organ mountains of New Mexico and the Huachuca and Santa Catalina ranges of Arizona, the two species occur together and have been mixed in collections (see list of specimens cited); but the plants hold their characters well and ordinarily may be distinguished readily by the scales of the under surface, either by the naked eye or using only a low-power lens.

The following specimens of *Cheilanthes Fendleri* are in the National Herbarium.

Texas: Eagle Mountain, Nov., 1881, *Havard;* El Paso to Monument 53, Sept., 1892, *Internat. Bound. Comm.* 986 (*Wagner*, coll.).

New Mexico: Burro Mountains, Nov., 1880, *Rusby* I, in greater part; same locality, *Rusby* H 1, in small part; same locality, alt. 2400 meters, *Metcalfe* 181; Big Burro Mountains, alt. 2100 meters, *Blumer* 1829; Hillsboro Peak, south end of Black Range, alt. 2700 meters, *Metcalfe* 1504; Oak Canyon, Folsom, dry sandstone cliffs, *Howell* 174; San Luis Mountains (on Mexican boundary line), *Mearns* 522, 2191 in part; El Capitan Mountains, Lincoln County, alt. 2100–2250 meters, *F. S. & E. S. Earle* 212; Las Vegas, June 24, 1891, *Dewey;* vicinity of Hot Springs, near Las Vegas, *Rose & Fitch* 17596; bluffs below Winsor's, Pecos National Forest, alt. 2490 meters, *Standley* 4152; Sierra Grande, *Howell* 207; volcanic hills near Sierra Grande, Union County, alt. 2100–2925 meters, *Standley* 6063; vicinity of Ute Park, Colfax County, alt. 2200–2900 meters, *Standley* 13934; Organ Mountains, Dona Ana County, alt. 1650–1800 meters, May 20, 1893, and Aug. 16, 1895, *Wooton*, both in part; same locality, *Wooton* 104, in part; without locality, *Wright* 2126, in part.

Arizona: Huachuca Mountains, *Mearns* 2589; north slopes of Huachuca Mountains, July–Oct., 1882, *Lemmon*, in part; near Fort Huachuca, *Wilcox* 54; Dragoon Mountains, March, 1881, *G. R. Vasey;* Rincon Mountains, alt. 2250 meters, *Nealley* 178; Santa Rita Mountains, alt. 1500 meters, May 22, 1884, *Pringle;* San Rita Mountains, July, 1881, *Pringle;* same locality, alt. 1350 meters, *Thornber* 324; Santa Catalina Mountains, March, 1881, *G. R. Vasey*, in greater part; Cherry Creek, Santa Catalina Mountains, alt. 1770 meters, *Shreve* 5113; summit of Gila Mountains, alt. 2040 meters, *Goldman* 2358; Cave Creek, near Portal, Chiricahua National Forest, Cochise County, alt. 1600–1800 meters, *Eggleston* 11014; Barfoot Fire Station, Chiricahua National Forest, Cochise County, alt. 2480 meters, *Eggleston* 10838; Riggs Canyon, Chiricahua Mountains, alt. 1710 meters, *Blumer* 1944; Big Emigrant Canyon, Chiricahua Mountains, alt. 1800–1950 meters, in a granite trough, *Blumer* 1505, 1907; Bowie, *Jones* 4282; Stale Mountain, alt. 2100 meters, *Leiberg* 5570.

Colorado: Rockwood, alt. 2400 meters, *Tweedy* 600; Manitou, alt.

2100 meters, *F. E. & E. S. Clements* 73.1; mountains near Pikes Peak, Aug., 1871, *ex herb. Canby*; Pike National Forest, *Guthrie* 51G.

4. Cheilanthes Wootoni Maxon, sp. nov.

Rhizome epigean, wide-creeping (5–15 cm.), with a few short branches, slender (about 1.5 mm. in diameter), terete, subflexuous, pale brown, deciduously paleaceous, the scales loosely imbricate, subsecund, mostly oblong-ovate or lance-oblong, acutish to long-acuminate, 2–3 mm. long, 0.7–0.9 mm. broad, straight or falcate, distantly denticulate, pale brown, membranaceous and concolorous, or sometimes bright glossy brown with pale scariose margins, the middle portion translucent and never strongly sclerotic. Fronds several, erect, distichous, mostly distant (0.5–3 cm. apart), 10–30 cm. long; stipe slender (1 mm. or less in diameter), 5–18 cm. long, subflexuous, castaneous, sublustrous, subpersistently paleaceous, the scales pale, linear-attenuate to filiform, ascending; lamina narrowly oblong to lance-oblong, acuminate, 5–18 cm. long, 2–4.5 cm. broad, tripinnate, the tertiary segments simple to ternately or pinnately divided; rachis similar to the stipe, persistently paleaceous; pinnae usually approximate, mostly alternate, ascending and usually arcuate, short-stalked, subequal in length, narrowly triangular and acuminate or sometimes several lower ones more broadly triangular and strongly inequilateral (broader on the lower side); rachises and whole under surface of the pinnae covered with widely imbricate scales, these extending beyond the margins of the pinnules and completely covering the numerous minute, obovate or rounded-pyriform, close ultimate segments beneath, the segments glabrous above; scales pale castaneous or yellowish brown in mass, nearly concolorous, whitish with age (the cells irregularly elongate, with sinuous partition walls), firmly attached at the sinus of the cordate to subcordate base, narrowly ovate, attenuate to a hair-pointed flexuous or tortuous apex, distantly denticulate, conspicuously long-ciliate in the basal part or beyond, the cilia of the larger scales and of the copiously filamentous, reduced under scales intricate, partly recurved between the segments and loosely overlying the upper surface; sporangia few, large, borne within the rounded, deeply cucullate distal border of the segment, the margin essentially unchanged. Leaf tissue rigidly herbaceous, bright green, minutely papillose, glistening.

Type in the United States National Herbarium, no. 835554, collected in Madero Canyon, Santa Rita Mountains, Arizona, September 21, 1914, by E. O. Wooton.

As noted elsewhere this species has hitherto been strangely confused with *C. Fendleri*, an unusual width of variation being ascribed to the latter species, notwithstanding that the distinguishing characters of the two plants hold without exception and are rather easily made out. In general, *C. Wootoni* is much more copiously scaly beneath than *C. Fendleri*, the scales being much slenderer, with long, flexuous, hair-pointed tips, and having numerous cilia, at least in the basal part; the scales of *C. Fendleri* are at most long-attenuate and are invariably non-ciliate. In *C. Wootoni*, moreover, the cilia of the larger scales and, more

especially, the filamentous tips of the reduced under ones are more or less intricately recurved among the segments and reach the upper surface of the pinnae, there freely overlying the ultimate rachises and segments—a condition which scarcely exists in *C. Fendleri* from the paucity of reduced scales and the absence of cilia upon the large ones. In general cell structure the scales of the two species are similar, but the characters above mentioned, together with the characteristic scanty aspect of *C. Fendleri*, with its more richly colored, concave scales, are unmistakable. The occasional occurrence together of these two closely related species is comparable to the case of *Pellaea Wrightiana* and *P. longimucronata*, recently discussed,* and is not in itself remarkable. Differences in scale structure, if fixed, are the very characters upon which dependence is to be placed, in xerophilous fern genera such as Cheilanthes, and there is in the present instance no indication whatever of intergradation.

The following additional specimens of *Cheilanthes Wootoni* are in the National Herbarium.

Arizona: North slopes of Huachuca Mountains, July-Oct., 1882, *Lemmon*, in part; Santa Rita Mountains, May 27, 1881, *Pringle;* Coronado Mountains, alt. 1950 meters, *Goldman* 2370; Lower Soldier Canyon, Santa Catalina Mountains, alt. 1320 meters, *Shreve* 5117; Santa Catalina Mountains, March, 1881, *G. R. Vasey*, in small part; head of Rincon Valley, Rincon Mountains, *Blumer* 3291; Nogales, *W. Palmer* 1202; Bowie, *Jones* 4268; Lowell, *W. F. Parish* 275; Clear Creek, *MacDougal* 629; without locality, *E. Palmer*.

New Mexico: Organ Mountains, Dona Ana County, alt. 1650–1800 meters, May 20, 1893, Aug. 6, 1895, and Nov., 1905, *Wooton*, the two first in part; same locality, July 7, 1897, *Wooton* 104, in part; same locality, June 9, 1906, *Standley;* Santa Fe, *Rothrock* 52; Burro Mountains, *Rusby* I, in small part; same locality, *Rusby* H 1, in greater part; without locality, *Wright* 2126, in part.

5. Cheilanthes Covillei Maxon, sp. nov.

Rhizome short-creeping and freely branched, the very numerous short divisions usually close and intricate, 2–4 mm. in diameter, very densely paleaceous, the scales appressed, closely imbricate, linear to lanceolate, long-attenuate, 1.5–2.5 mm. long, 0.2–0.5 mm. broad, straight, more or less denticulate-serrulate at the tip, dark brown or blackish, rigid, strongly sclerotic and opaque throughout, except for the extremely narrow, delicate, pale border. Fronds numerous, erect, closely distichous, 10–30 cm. long; stipe slender to stoutish (0.6–1.3 mm. in diameter), 5–17 cm. long, straight or subflexuous from an arcuate base, brown to dark purplish, sublustrous, thinly and deciduously paleaceous, the scales small, pale, linear-attenuate, laxly ascending; lamina oblong to ovate-deltoid or deltoid, acuminate, 5–14 cm. long, 2–6 cm. broad at or near the base, tripinnate, the larger tertiary segments ternately to pinnately divided, the divisions commonly unequal; rachis similar to the stipe, but more densely paleaceous; larger pinnae 8–12 pairs, mostly contiguous or

* Proc. Biol. Soc. Washington, **30** : 179–184. 1917.

approximate (the lowermost 1 or 2 pairs farther apart), ascending, often falcate and somewhat involute in drying, narrowly deltoid, or the short-stalked lower ones rather broadly deltoid and strongly inequilateral (broader on the lower side); rachises and whole lower surfaces of the pinnae densely paleaceous, the scales widely imbricate, extending beyond the margin of the pinnules and entirely concealing the thick, roundish or irregularly oval ultimate segments beneath, the segments glabrous above; scales pale castaneous with lighter borders and tips, or sometimes whitish with a dark center, large, variable in outline (varying from exactly cordate and acute to deltoid-cordate and acuminate or ovate-lanceolate and long-acuminate or attenuate), lightly attached above the closed sinus of the very deeply cordate base (the lobes overlapping), long-ciliate at the base or upward to the middle, erose-denticulate toward the apex, the cells irregular, with deeply sinuous partition walls; rachises of the pinnae bearing few or numerous slender pale scales above and at the sides, these recurved upon the upper side of the segments, together with the tips and long cilia of some of the large under scales; sporangia rather numerous, borne within the deeply recurved semicircular border of the distal half or two-thirds of the segment, the margin lightly crenate, nearly unmodified. Leaf tissue dull to yellowish green, herbaceous, minutely papillose.

Type in the United States National Herbarium, no. 51039, collected in Surprise Canyon, Panamint Mountains, Inyo County, California, altitude 1550 meters, April 13, 1891, by Frederick V. Coville and Frederick Funston (no. 593), on the Death Valley Expedition of the United States Department of Agriculture.

As stated above, the correctness of referring this plant of southern California and near-by territory to *C. myriophylla* has been repeatedly questioned. Eaton, acting apparently at the suggestion of his contributing correspondent, William Stout, at one time separated it in the herbarium as a new species and gave it a manuscript name, according to Mr. C. A. Weatherby, who has examined the Eaton material at New Haven. This disposition was entirely correct, notwithstanding the broad variation it exhibits in shape, color, and ciliation of lamina scales. In relation to *C. Fendleri* and *C. Wootoni* its most notable characters are the rigid, thick, blackish or dark brown rhizome scales and the very deeply cordate bases of the lamina scales, the latter so delicately attached above the closed sinus as to rotate at touch and to be readily detached from the lamina. The characters which distinguish it from other related species and from a peculiar form described below as *C. Covillei intertexta* are indicated in the key.

The following additional specimens of *Cheilanthes Covillei* are in the National Herbarium.

California: Hills west of Big Pine, Inyo County, *Heller* 8261; Surprise Canyon, Panamint Mountains, Inyo County, alt. 1625 meters, *Coville & Funston* 643; same locality, alt. 1560 meters, *Coville & Funton* 651; Slate Range, Inyo County, alt. 1150 meters, *Coville & Funston* 188; near Willow Creek, Panamint Mountains, Inyo County, alt. 1950–2300 meters, *Coville & Funston* 777; east slope of the Panamint Mountains,

one mile north of Panamint Pass, alt. 2560 meters, *Coville & Funston* 540; Lone Pine, Inyo County, alt. 2100 meters, May 14, 1897, *Jones;* Tehachapi, Kern County, March 14, 1913, *Wooton;* Topatopa Mountains, Ventura County, alt. 1950 meters, *Abrams & McGregor* 88; Pasadena, *Jones* 3033; near summit of Mount Washburn, San Gabriel Mountains, Los Angeles County, *Moxley* 419; trail to Barley Flats, San Gabriel Mountains, alt. 1500 meters, *Moxley* 399; Laguna, Orange County, *Internat. Bound. Comm.* 3608 (*Schoenfeldt*, coll.); Whitewater, *G. R. Vasey* 13; several localities in the San Antonio Mountains, alt. 900–2250 meters, *Johnston* 86, 1594, 1729, 1739; Palm Canyon, Riverside County, alt. 750 meters, *Johnston* 1113; Riverside County, in dry, rocky, open situations, *Grant* 220; near Hemet Lake, San Jacinto Mountains, alt. 1340 meters, *Leiberg* 3155; San Jacinto Canyon, Riverside County, alt. 675 meters, *Johnston* 1830; Santa Ysabel, San Diego County, *Henshaw* 41; southwestern part of the Colorado Desert, San Diego County, *Orcutt* 2188; Warner's Hot Springs, *Eastwood* 2615; Jacumba Hot Springs, San Diego County, near Monument 233, *Internat. Bound. Comm.* 3232 (*Schoenfeldt*, coll.); San Diego County, *G. R. Vasey* 690; Mill Creek Falls, San Bernardino County, *S. B. Parish* 5073; San Bernardino Mountains, among rocks, *S. B. & W. F. Parish* 509; "southern California," *Parry & Lemmon* 425; White Cliff Creek, *Bigelow*; small butte about 5 miles north of Grizzly Flats, Eldorado County, alt. 1500 meters, *Watkins* 1; Yosemite Falls, alt. 1290 meters, *Watkins* 2.

Nevada: Virgin River, Bunkerville, rock crevices in canyons, *Goodding* 736.

Arizona: Hills 4 miles northwest of Congress Junction, Yavapai County, alt. 750–900 meters, Feb. 17, 1912, *Wooton;* Salt River, 12 miles north of McMillinville, alt. 840 meters, *Goldman* 2670; "northern Arizona," 1869, *E. Palmer.*

Lower California: Mountains, Los Angeles Bay, 1887, *E. Palmer* 553; locality wanting, "rocky places," April, 1882, *Pringle;* "northern Lower California," Sept. 8, 1884, *Orcutt.*

5a. Cheilanthes Covillei intertexta Maxon, subsp. nov.

Similar in general characters to *C. Covillei*, but differing in its smaller, shorter-creeping, subnodose rhizomes, its darker green and relatively larger lamina segments, and conspicuously in the vestiture of the lamina; segments bearing one to several greatly reduced, whitish, stellate, subpersistent scales above, thickly clothed beneath with several to numerous, bright castaneous to cinnamomeous, imbricate scales, these highly variable in size and ciliation, the larger ones (like those of the secondary and tertiary rachises) mostly deltoid-lanceolate, long-attenuate, sinnate-denticulate nearly throughout, freely long-ciliate at the cordate base, these scales underlaid by others successively smaller and more copiously ciliate, the ultimate ones very greatly reduced (body of scales nearly obsolete), entangled and not separable, forming a loose tomentum held in place by the crenulate, widely revolute border of the segment.

Type in the Dudley Herbarium, Leland Stanford Junior University,

no. 63946, collected at the top of Black Mountain, Santa Cruz Mountains, Santa Clara County, California, July 6, 1903, by W. R. Dudley.

The following additional specimens are at hand:*

California: West end of Loma Prieta Peak, Santa Cruz Mountains, Nov. 1, 1903, *Dudley* (S); Mount Day in the Mount Hamilton Range, Santa Clara County, altitude 1170 meters, Apr. 29, 1908, *Heller;* same locality, "May 23," *R. J. Smith* (S); bank of Mill Creek, Ukiah, Mendocino County, 1866, *Bolander* 4640; Hood's Peak, Sonoma County, March, 1893, *Michener & Bioletti.*

Nevada: Virginia City, *Bloomer.*

The characters above indicated would seem sufficient for the separation of this form as specifically distinct, were it not for additional specimens from Hood's Peak (collected by Bioletti in 1892, and by Michener and Bioletti in May, 1893), which, though lacking reduced stellate scales on the upper side of the segments, seem to show in the scaly covering of the under side of the lamina a transition to the broad form of scales characteristic of true *C. Covillei*, in which a single large scale will completely cover one or several minute segments. The distinctive scale characters are doubtless correlated with conditions of habitat and climate not surrounding the more southerly plant, but they suggest the desirability of further study of this form with the help to be gained from more complete material. In abundance and high color of reduced scales beneath there is a considerable resemblance to *C. Clevelandii*, and it is otherwise evident that *C. Clevelandii*, *C. Covillei*, and *C. Covillei intertexta* are of common origin.

6. Cheilanthes Clevelandii D. C. Eaton, Bull. Torrey Club **6:** 33. 1875.

Rhizome creeping, epigean, ligneous, relatively slender (2–3.5 mm. in diameter), flexuous, with a few short branches, coarsely radicose beneath, densely and persistently paleaceous, the scales imbricate, closely appressed, subulate to lance-attenuate, ending in a fragile filiform tip, 2.5–3 mm. long, about 0.5 mm. broad, bright to dark brown, glossy, the median portion moderately sclerotic or strongly so toward the apex, the paler borders semitranslucent, subentire. Fronds several, erect, distichous, 1 cm. or less apart, obliquely attached, 15–50 cm. long; stipe 7–24 cm. long, stout (1.2–2 mm. in diameter), light brown, often broadly flexuous, thinly and deciduously paleaceous, the scales minute, very slender, pale; lamina linear-lanceolate to ovate or deltoid-oblong, acuminate, 7–26 cm. long, 2.5–8 cm. broad, tripinnate or nearly quadripinnate; rachis similar to the stipe but persistently paleaceous, the scales darker; pinnae numerous, mostly alternate and contiguous, ascending, often strongly so, falcate, narrowly deltoid to deltoid-oblong, or the lower ones sometimes exactly deltoid; secondary and tertiary rachises and the midribs of the segments copiously appressed-paleaceous beneath, the scales small, imbricate, closely investing and wholly concealing the segments, bright to dark castaneous at maturity, deltoid-ovate, attached above the closed sinus of the deeply cordate base, abruptly long-acuminate and attenuate, conspicuously erose-dentate, the teeth long-ciliate,

*The specimens indicated by (S) are in the Dudley Herbarium.

the numerous cilia of the reduced under scales closely entangled; cells of the scales irregular, with deeply sinuous partition walls; tertiary segments simple to ternately divided or sometimes fully pinnate; ultimate segments in general very small, flattish, close, sessile, subcordate-orbicular (the terminal ones larger and relatively longer), above glabrous, but with the recurved cilia of some of the large dorsal scales and the slender divisions of reduced filamentous scales of the upper side of the rachises lying among and partly over them; sporangia rather numerous, borne partly within the narrowly revolute border of the segments nearly throughout, the margin crenulate, nearly unchanged. Leaf tissue rigidly spongiose-herbaceous, dull green.

This species was described originally from specimens collected "on a mountain about forty miles from San Diego, California," at an elevation of about 750 meters, by Daniel Cleveland, in 1874. Its range is stated by Parish* as "mountains of San Diego County [California], north to Beaumont, Riverside County, and south into Lower California." The numerous specimens in the National Herbarium are all from San Diego and Riverside counties with the exception of the following, these apparently extending the accepted range of the species: Bartlett's Canal, Santa Barbara, California, 1875, *Rothrock* 60, labelled by Davenport "a large form of *C. gracillima;*" Santa Cruz Island, California, August, 1893, *Yates;* same locality, July 17, 1917, *Eastwood* 6399.

Although occasional specimens of the common California plant here called *C. Covillei* have been determined as *C. Clevelandii*, true *C. Clevelandii* has rarely been misidentified. In its large size, slender, woody, appressed-paleaceous, creeping rhizome, stout, light brown stipes, spaced pinnules, and general scanty aspect it is well marked, as also in the subcordate form of its pinnules and their dense covering of closely appressed, small, deltoid-ovate, richly colored scales. It is more copiously fertile than most related species, the sporangia less concealed and extending almost to the extreme base of the segments. Its nearest ally, apparently, is *C. Covillei*.

* Fern Bull. **12**: 7. 1904.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FOUR NEW MOLLUSKS FROM THE PHILIPPINE ISLANDS.

BY PAUL BARTSCH*.

Among several lots of Philippine Islands mollusks sent to the United States National Museum for determination by Mr. Walter F. Webb are four forms that require a name, which is here provided. Mr. Webb, with characteristic generosity, has donated the types of these subspecies to the United States National Museum.

Cochlostyla mirabilis donsalana, new subspecies.

In two shells from Donsal, the color of the first three and a quarter turns is white, from there on it gradually changes to wax yellow, deepening steadily toward the aperture, behind which it is usually pale olive with a rusty suffusion. The spiral brown color bands may be absent or reduced to a mere line at the summit and a narrow zone a little anterior to the middle of the turns, the latter scarcely reaching the last half of the last turn. No dark area surrounds the insertion of the columella nor are there any spiral bands on the base. The shell is far more elevated than is usually the case in forms of *Cochlostyla mirabilis* and the aperture is very large and very oblique, with a strong reflected white peristome. The interior is white.

The type, Cat. No. 219021, U. S. N. M., has 5 whorls, and measures: altitude, 43.6 mm.; greater diameter, 35.6 mm.; lesser diameter, 30 mm. The other specimen is in Mr. Webb's collection.

Helicostyla woodiana paracaleana, new subspecies.

Shell similar to *Helicostyla woodiana reevi* Broderip, but broader and less elevated, with the general ground color tending toward olive. In *Helicostyla woodiana reevi* the ground color is chestnut brown. The aperture is very large and considerably broader and shorter than in

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Helicostyla woodiana reevi. The peristome is also much darker in the present form. The spiral banding in the type would indicate that it is probably as variable in this subspecies as in the other forms that constitute *Helicostyla woodiana.*

The type, Cat. No. 219029, U. S. N. M., comes from Paracale, Ambos Camarines, Luzon. It has 5.5 whorls and measures: height, 75 mm.; greater diameter, 59 mm.; lesser diameter, 46 mm.

Geophorus agglutinans leytensis, new subspecies.

Shell similar to *Geophorus agglutinans agglutinans* Sowerby, but much smaller, with the upper portion of the whorls bright chestnut brown, excepting a narrow yellow zone at the summit and another at the periphery. In *Geophorus agglutinans agglutinans* Sowerby, the upper surface is bright yellow. The base of the present subspecies has a broad brown band covering the anterior third, which is separated from the periphery by a narrow yellow zone; the rest is yellow. In *Geophhorus agglutinans agglutinans* the base is inclined to be unicolor, or if a band is present it is merely indicated.

The type and another specimen, Cat. No. 219023, U. S. N. M., come from Jaro, Leyte. The type has 5.5 whorls and measures: altitude, 8.3 mm.; greater diameter, 13 mm.; lesser diameter, 11.3 mm. Four additional specimens are in Mr. Webb's collection. A cotype of *Geophorus agglutinans agglutinans* collected by Cummings at Dingle, Panay, has 5 whorls and measures: altitude, 9.5 mm.; greater diameter, 17.6 mm.; lesser diameter, 14.7 mm.

Vivipara cebuensis boholensis, new subspecies.

Shell similar to *Vivipara cebuensis* but in every way much larger than that form with the umbilicus much wider and much less covered. The obsolete shoulder is more pronounced in the present form, while the fine spiral sculpture is decidedly less developed. There is also a tendency toward obsolete maleations on the last turn.

We have seen two specimens of this subspecies from Bohol, the type, Cat. No. 219002, U. S. N. M., and another specimen in Mr. Walter F. Webb's collection. The type has lost about the first half turn, the 5.5 remaining measure: altitude, 36.5 mm.; greater diameter, 27.5 mm.; lesser diameter, 22.5 mm.

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PROCEEDINGS

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TWO NEW GENERA AND EIGHT NEW BIRDS FROM CELEBES.

BY J. H. RILEY.*

When Dr. W. L. Abbott gave up his explorations in the East a few years ago, he made arrangements to have this work continued. Mr. H. C. Raven, who was selected to carry on the work, visited East Borneo and later crossed to Celebes where he performed excellent work in the north peninsula and in the mountains of the northern part of Middle Celebes, when, early in 1918, operations were temporarily suspended. The following new birds have been discovered in identifying this material and are published in advance of a complete catalogue of the collection.

Caprimulgus affinis propinquus, subsp. nov.

Type, adult male, U. S. National Museum, No. 250,197, Parigi, Celebes, September 28, 1916. Collected by H. C. Raven (original No 3175).

Similar to *Caprimulgus affinis griseatus* but buff of belly unbarred, the ear-coverts and sides of neck more heavily marked with buff; the buffy spotting on the wing-coverts more numerous and pronounced; the white of the outer tail feather more extended basally. Wing, 171; tail, 101; culmen, 10 mm.

Remarks.—I have been able to compare this specimen with three males of *Caprimulgus affinis affinis* from Java and one from Borneo and seven males of *Caprimulgus affinis griseatus* from Sibuyan and Luzon, Philippines. From the former it is much lighter, both above and below, and the buffy spots on the chest and wing-coverts are more numerous and pronounced and much lighter; the vermiculations on the back finer and the tail-bars above narrower. From the latter it is much closer in color and forms a connecting link ; the chief difference is the unbarred belly.

Caprimulgus affinis mindanensis Mearns† is a dark bird like true *affinis* but with finer vermiculations above and with the belly barred, with which the present form hardly needs comparison. It seems strange that the Celebes bird should resemble the one from Luzon rather than that from Mindanao.

* Published with the permission of the Secretary of the Smithsonian Institution.

† Proc. Biol. Soc. Wash., 18, 1905. 85.

Collocalia vestita aenigma, subsp. nov.

Type, adult male, U. S. National Museum, No. 250207, Parigi, Celebes, September 10, 1916. Collected by H. C. Raven (original No. 3056).

Similar to *Collocalia vestita vestita* from Java but much darker above, the wings and tail more shiny; lighter below, especially on the throat. Wing, 114.5; tail, 48.5; culmen, 5 mm.

Remarks.—Material examined consists of the type, three females and an additional male from the type locality, one male and two females from Gimpoe, and one male and two females from Pinedapa. These are so much darker above, with the throats so much lighter than the Javan form that they doubtless represent a distinct species.

Stresemann* records his *Collocalia fuciphaga micans* from Celebes but that belongs to the unfeathered-tarsi section of the genus, so that Celebes like Java has two closed related species that can only be told apart with difficulty.

Rhamphococcyx centralis, sp. nov.

Type, adult male, U. S. National Museum, 250,806, Rano Lindoe, Celebes, March 21, 1917. Collected by H. C. Raven (original No. 3989).

Similar to *Rhamphococcyx c. calorhynchus* but bill larger and more arched, the top of head mouse gray, throat, chest, and mantle vinaceous-russet, lighter on the throat and hind-neck and shading into cameo brown on the chest and mantle; wings and tail less purplish. Wing, 189; tail, 343; culmen, 44; depth of bill at nostril, 20 mm.

Remarks.—In *R. c. calorhynchus* the top of head is deep mouse gray, the throat, chest, and mantle kaiser brown. At first it would seem that I am redescribing *Rhamphococcyx calorhynchus meridionalis* Meyer and Wiglesworth, but after carefully reading their description in Birds Celebes, I, 1898, 227, wherein they say the only difference between it and *R. c. calorhynchus* is the lighter color of the top of the head, I have come to the conclusion that I am dealing with a different species. I say species advisably, for Raven took both the present bird and *R. c. calorhynchus* at Parigi. In addition to the type, there are a male and female from Parigi, two females from Laboea Sore, two males and five females from Pinedapa, and one female from Gimpoe.

From the following measurements it will be seen that the wing in the above described species is longer, also:

	Wing.	Tail	Culmen	Depth of Bill at Nostril.
Six males of *R. c. calorhynchus*	177.7	327.2	43.2	20
Four males of *R. centralis*	189	323	45.4	21
Six females of *R. c. calorhynchus*	175.4	327.8	42.7	19
Nine females of *R. centralis*	185.9	349.7	45.4	21.2

* Verhand. Orn. Ges. Bayern, 12, 1914, 6.

Lophozosterops striaticeps, sp. nov.

Type, adult male, U. S. National Museum, No. 251,151, Goenoeng Lehio, Celebes, January 13, 1917. Collected by H. C. Raven (original No. 3397).

Above warbler green, the upper back with a few fine light yellowish shaft streaks; the top of head dark neutral gray with fine white shaft stripes; frons and lores buffy white; ear-coverts and cheeks lighter gray than top of head, the white shaft streaks a little coarser; throat and jugulum buffy white; rest of underparts lemon yellow; flanks pyrite yellow; wings the color of the back, the primaries and outer secondaries chaetura drab, except on the outer margin; bend of the wing margined with light yellow; under wing coverts white with a yellowish wash; primaries and secondaries where they rest against the sides of the body strongly margined on the inner web and basally with yellowish white; tail chaetura drab washed and margined with the color of the back. Wing, 63; tail, 45; tarsus, 16.5; middle toe, 10 mm.

Remarks.—A good series was taken at Rano Rano and Besoa, in the central mountainous part of the island. The type, from Goenoeng Lehio, is brighter, more yellowish above and brighter below than the Rano-Besoa series. Judging from the description and plate in Meyer and Wiglesworth* the above is closely related to *Lophozosterops squamiceps,* from which it differs in lacking the terminal edges of silvery gray to the feathers of the top of the head; the throat buffy-white; the back of a different shade of green; the lower parts brighter yellow; and there are other slight differences.

Coracornis,† gen. nov.

Apparently related to *Pachycephala* Vigors and Horsfield‡ but the rictal bristles longer; the outer primary proportionally longer and broader; rectrices broader, bluntly pointed (instead of obliquely rounded), and the webs at the end semi-decomposed, giving a softer texture to the feathers; nostril oval and parallel with the tomia (instead of short ovate and oblique); and color pattern entirely different.

Type and only known species—*Coracornis raveni.*

Coracornis raveni,† sp. nov.

Type, adult male, U. S. National Museum, No. 252,177, Rano Rano, Celebes, December 23, 1917. Collected by H. C. Raven (original No. 4840).

Chin, upper throat, sides of face, top of head, and hind neck sooty-black with a slight olive tinge on the hind neck; lesser wing-coverts, mantle, and rump, mahogany red; middle and greater wing-coverts, remiges, rectrices, and longer upper tail-coverts, black; lower throat, jugulum, and breast dark olive gray with a light yellowish olive wash; belly and crissum lighter than the breast and with a much heavier wash of light

* Birds, Celebes, 2, 1898. 485, pl. 29.

† Named in honor of H. C. Raven.

‡ As restricted by Mathews, List Birds Australia, 1913. 177.

yellowish olive, hiding the under color; under wing-coverts like the breast; remiges below fuscous, the inner primaries and secondaries bordered slightly on the inner web with tilleul-buff. Wing, 82.5; tail, 67.5; culmen, 14; tarsus, 23; middle toe, 13.5 mm.

The female quite different, may be described as follows: above, raw umber, lighter and with a grayish cast on top of head; tail sepia, the feathers edged on the outer web with argus brown, but this color not quite reaching the tip; upper tail-coverts, argus brown; below buffy brown, lighter on the chin and with a pronounced lemon yellow wash on middle of belly; under tail-coverts ochraceous-tawny; wings prout's brown, the inner webs of the primaries and outer secondaries fuscous; under wing-coverts grayish olive with a slight yellowish tinge along the margin of the wing; the remiges where they rest against the body narrowly bordered with light ochraceous buff.

Remarks.—Besides the type and adult female described above, there are a young male, in the plumage of the female, from the type locality and an adult female from Goenoeng Lehio. The wing and tail in the type specimen are in partial molt. The only female that has an apparently perfect tail has it slightly rounded.

Cataponera abditiva, sp. nov.

Type, adult female, U. S. National Museum, No. 251,966, Rano Rano, Celebes, December 21, 1917. Collected by H. C. Raven (original No. 4815).

Above mummy brown, shading into dresden brown on the forehead and crown; below dresden brown, shading into buckthorn brown on the belly; a rather broad superciliary line extending back over the ear-coverts and widening posteriorly and a spot on the lower eye-lid, black; upper tail-coverts, tail, remiges, and the longer under tail-coverts mars brown; bill (in dried skin) ochraceous orange. Wing, 129; tail, 109; culmen, 25; tarsus, 39; middle toe, 26 mm.

Remarks.—This species is so very different from the description and plate of *Cataponera turdoides* Hartert given in Meyer and Wiglesworth* that it scarcely needs comparison. Hartert's species come from the south while the present comes from the central mountainous part of the island. Only the type was secured.

Celebesia, gen. nov.

Simliar to *Malindangia* Mearns but bill proportionally narrower (width just forward of the nostril equal to the depth instead of broader); fifth primary (counting from the outside) shorter than the third instead of longer; rectrices more rounded; plumage not so soft in texture; and color pattern different.

Type.—Celebesia abbotti.

Celebesia abbotti,† sp. nov.

Type, adult male, U. S. National Museum, No. 252,125, Rano Rano, Celebes, December 12, 1917. Collected by H. C. Raven (original No. 4752).

* Birds Celebes, 2, 1898, 503, pl. 29.

† Named in honor of Dr. W. L. Abbott.

Upper-parts, including the lesser wing-coverts, slate-gray; lores, superciliary, auriculars, and throat, deep shining black; remaining under-parts, white; wings (except the lesser coverts) black, the feathers edged outwardly with the color of the back; bend of wing blackish; under wing-coverts, white; middle tail feathers slightly darker than the back with an irregular line along the shaft towards the tip and shaft, black; remaining tail feathers blackish, the three outer with a sub-terminal band of deep neutral gray, widest on the outer—and almost disappearing on the third, all the tail feathers narrowly bordered at the tip with white, this almost obsolete as the middle feathers are approached; thighs black. Wing, 114; tail, 81; culmen, 20; tarsus, 25.5; middle toe, 17.5 mm.

Remarks.—There are seven males and four females in the collection, all from the type locality. The females only differ from the males in having the sides of face and throat slate gray instead of shining black. *Celebesia* evidently represents *Malindangia* (from the mountains of Mindanao) in the highlands of Celebes.

Cryptolopha nesophila, sp. nov.

Type.—adult male, U. S. National Museum, No. 251,146, Goenoeng Lehio, Celebes, January 19, 1917. Collected by H. C. Raven (original No. 3424).

Above citrine, deepening on top of head and nape into medal bronze; supereiliary stripe barium yellow; loral streak dusky; post ocular streak color of the head; below including cheeks and ear-coverts citron yellow, streaked with whitish and spotted on the chest with obscure spots of buffy citrine; under tail-coverts citron yellow; flanks yellowish citrine; wings chaetura drab, the feathers edged externally with the color of the back, the tips of the greater coverts a little paler but not forming a bar; bend of wing edged with citron yellow; under wing coverts whitish; remiges below hair brown, the feathers where they rest against body bordered with whitish or internally pale buff; tail above olive with a citrine wash, the outer edges of the feathers brighter basally. Wing, 58; tail, 40; culmen, 11; tarsus, 20.5; middle toe, 9.5 mm.

Remarks.—In addition to the type, there are four males and one female from the type locality, a female from the Lindoe Trail, and a good series of both sexes from Rano Rano.

The nearest ally of this species is evidently *Cryptolopha sarasinorum* Meyer and Wiglesworth, from which it differs in lacking the crown stripe and the white on the two outer rectrices.

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THREE NEW SUBSPECIES OF *PASSERELLA ILIACA*.

BY H. S. SWARTH.

(Contribution from the Museum of Vertebrate Zoology of the University of California.)

The writer has been recently engaged in a study of the fox sparrows (*Passerella iliaca* and subspecies) with special reference to the manner of occurrence of the several forms in California. In the course of this work evidence was soon forthcoming demonstrating the existence of certain distinguishable local races, as yet unnamed, the terms *megarhyncha* and *schistacea* proving each to cover composites of several forms. As the proposed general account of the group will not be ready for publication for some time to come, it is desirable that designations be affixed to these subspecies in advance of the appearance of the longer paper.

One of the first fruits of the study was comprised in a better understanding of the race which Mailliard (Condor XX, 1918, p. 138) has named *Passerella iliaca brevicauda,* material gathered together from various sources by the present writer proving fortunately to include specimens which supplied Mr. Mailliard with the final evidence needed to demonstrate the distinctness of this subspecies. In the present paper three additional races are named, all from California. The total number of recognizable subspecies of *Passerella iliaca* is now sixteen, and all of these occur at some season within this State.

Passerella iliaca mariposae, new subspecies.

YOSEMITE FOX SPARROW

Type.—Adult male; no. 25693, Mus. Vert. Zool.; ridge at 7000 feet, near Chinquapin, Yosemite Park, California; June 10, 1915; collected by J. Grinnell; original number 3284.

Subspecific characters.—In bill structure intermediate between *Passerella iliaca megarhyncha* and *P. i. stephensi.* In *megarhyncha* the bill is broad and stubby, in *mariposae* it is relatively long, with more attenuated tip, just the same shape as in *stephensi,* but smaller. *P. i. mariposae* also differs from *megarhyncha* in its more grayish coloration. It is closely similar to *stephensi* in general appearance, save for the smaller bill; similar to *monoensis* in general appearance, but with larger bill. Geographically and structurally *mariposae* occupies an intermediate position between *monoensis* and *stephensi.*

Remarks.—Through the courtesy of the authorities of the United States National Museum I have been permitted to examine the type of *Passerella megarhynchus* Baird. This bird (U. S. Nat. Mus. no. 12402) was collected at Fort Tejon, California, by Xantus, and while no date of capture is entered upon the label, it is obviously a winter collected specimen. *Passerella i. megarhyncha* is the "thick-billed sparrow" that is of most common occurrence in winter in southern California, but, contrary to previous belief, it is *not* the same as the "thick-billed sparrow" of the Sierra Nevada. *P. i. megarhyncha* has a stubby bill, and is of relatively brownish coloration; *P. i. mariposae* has a larger bill, more finely pointed, and is distinctly gray in color. The type specimen of *megarhyncha* is rather more grayish dorsally than the average of the race, but the shape of the bill in this specimen is outside the range of variation in *P. i. mariposae,* and exactly like that of the majority of the brown colored birds found commonly in winter in southern California.

Passerella i. mariposae, as shown by specimens at hand, occurs in summer from the vicinity of Mount Shasta south along the Sierra Nevada, on the west slope at least as far as the Yosemite region, on the east slope to Kearsarge Pass. There are a few winter examples of *mariposae* at hand from the San Diegan district, California, but so few that it is evident that these localities do not represent the main winter home of the race. On the other hand, *megarhyncha* occurs in this section in winter in abundance, but its breeding range is as yet not defined.

Passerella iliaca fulva, new subspecies.

WARNER MOUNTAINS FOX SPARROW.

Type.—Adult male; no. 14795, Mus. Vert. Zool.; Sugar Hill (5000 feet), Warner Mountains, Modoc County, California; May 19, 1910; collected by W. P. Taylor and H. C. Bryant; original number 2887.

Subspecific characters.—Bill intermediate in size between *Passerella iliaca schistacea* and *P. i. mariposae;* about the same size as in *P. i. monoensis,* but more slender and attenuated than the short but rather heavy bill of that subspecies. Coloration more brownish than in *mariposae* and *monoensis;* about as in *schistacea.* Wing and tail measurements somewhat less than in *mariposae,* about the same as in *schistacea.*

Remarks.—Size of bill alone suffices to distinguish *Passerella i. fulva* from any of the other fox sparrows save *monoensis.* From the latter form *fulva* may be told by the somewhat differently shaped bill, and by dif-

ference in coloration. In worn summer plumage color differences are more or less obscured, but in freshly molted fall specimens they are readily apparent.

There is a large series of specimens at hand from the Warner Mountains, the summer home of this subspecies, but there are no winter birds or migrants available indicating its range at other seasons.

Passerella iliaca canescens, new subspecies.

WHITE MOUNTAINS FOX SPARROW

Type.—Immature male (in nearly complete first winter plumage); no. 28439, Mus. Vert. Zool.; Wyman Creek at 8250 feet altitude, east slope of White Mountains, Inyo County, California; August 15, 1917; collected by A. C. Shelton; original number 3549.

Subspecific characters.—Most nearly similar to *Passerella iliaca schistacea*, under which name the White Mountains bird has formerly been included, but differing from that race in its much more grayish coloration.

Remarks.—This subspecies is based upon a series of twelve specimens from several points in the Boreal zone on the White Mountains, in Mono and Inyo counties, California. The series includes three adults in rather worn summer plumage, two adults undergoing the annual molt but mostly in the new winter plumage, one immature (the type) in nearly complete first winter plumage, and six in juvenile plumage, some of them showing a few feathers of the first winter plumage.

Comparisons with *P. i. schistacea* were made with series of breeding birds from northern Nevada and south central Oregon, and with migrants and winter visitants from various points in California. There are no noticeable differences in measurements between these two races, though, as *canescens* is at the minimum of bill development in the species, it is possible to make a selection of specimens of *schistacea* from certain parts of the range of that subspecies, showing very much larger bills.

The gray coloration of *canescens* as compared with the browner *schistacea* is least noticeable in abraded summer plumage, but in newly acquired fall plumage it is evident at a glance; in juveniles also the difference in color between the two subspecies is apparent, though to a lesser degree.

There are two winter birds at hand that appear to be referable to the subspecies *canescens*, one from Mount Wilson, Los Angeles County, California, the other from Blythe, Riverside County (on the Colorado River), California. These afford as yet our only clue as to the winter home of the race.

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NEW SPIROBOLOID DIPLOPODS.

BY RALPH V. CHAMBERLIN.

In working over a collection of diplopods from Claremont, Cal., sent me for identification by Prof. W. A. Hilton, several unnamed forms were found. Preliminary accounts of these and three other new forms from the same State are given below in order that the names may be validated for early use. The typical material is all at the Museum of Comparative Zoology, Cambridge.

SPIROBOLIDAE.

Tylobolus claremontus, sp. nov.

Readily distinguishable from other species in the form of the male gonopods. In these the anterior median plate is broadly triangular, much narrower across the distal end than in *T. deses* and the tip attaining the level of the distal ends of the anterior coxal plates. The latter are distally depressed, the distomesal corner oblique, not at all elevated or produced. Tips of telopodites of anterior pair bent caudad and then ectad, somewhat uncate. Telopodite of posterior gonopods strongly uncate as usual; the distal spine more elongate and curved than in *uncigerus,* not pilose, and lacking any lobe at base such as present in *deses.* General color brown; each segment with a black annulus in front of suture, and also darkened along caudal border or not; in one specimen the dark brown to reddish brown bands about the caudal borders are conspicuous while in front of the sutures the segments are scarcely at all darkened; anal valves and collum dusky; legs fulvous. Clypeal foveolae 5+5 or sometimes 6+6, counting a smaller one a little above the level of the others on each side. Collum angularly narrowed below; anterior margin flattened or very slightly concave opposite cardo. Second somite extending well below level of collum, the ventrocaudal corner of lower part oblique, the anterior vertical. Surface of somites in general densely punctate in front of suture with the usual associated short striae,

giving the appearance of being finely rugose, the punctae more sparse on metazonites. Sutures deeply impressed. Mesal borders of anal valves protruding prominently. Third legs of male with the usual large uncate process on coxa, the anterior or distal end of hook blunt, rounded. Coxae of next four pairs of legs with smaller, flattened processes which decrease in size in going caudad. Segments forty-two to forty-five in number.

Length (male), near 58 mm.; width, 7 mm.

Locality.—California: Claremont. (W. A. Hilton).

Tylobolus castaneus, sp. nov.

Of a chestnut or, sometimes, of a brighter, cherry red, color, the color in an annulus along caudal border deeper; antennae brown; legs pale brown to fulvous. Aside from the characteristic coloration to be distinguished especially by the structure of the male gonopods. The anterior median plate proportionately much broader than in uncigerus, with the lateral margins evenly convex, not at all angulated as in deses, its apex but little exceeded by the anterior coxal plates which rise in a slight rounded process at the distomesal angle. Antedior telopodites distally narrow, somewhat uncate at tip in the usual way. The telopodites of posterior gonopods narrowed more gradually than usual to an acute point, the distal process scarcely spiniform, not pilose but finely scabrous, short. Cephalic sulcus widely interrupted in the frontal region. Clypeal foveolae 4+4. Dental prominences in labral sinus rounded, 3+3. Collum narrowly rounded below. Anterior margin a little concave just above lower end, convex on opposite caudal side. Second segment produced below as usual, the ventral margin excavated behind so that the anterior half bulges, the anteroventral corner protruding as a strongly rounded process. Surface of segments roughened by numerous short impressed lines, coriarious. Sutures sharply impressed. Number of segments, forty-seven.

Length (male), near 40 mm.; width, 5 mm.

Locality.—California: Brookdale. (R. V. Chamberlin).

Hiltonius, gen. nov.

Differs from *Spirobolus* and agrees with *Tylobolus* in lacking a free inner piece to the posterior gonopods. Differs from *Tylobolus* in having the telopodite of posterior gonopods erect, not at all uncate and not terminating in a narrow distal process or spine, the mesal margin dentate. Coxal lobes of anterior gonopods tuberculate on anterior face mesally and on mesal face as in *Tylobolus*. Coxae of third legs of male with prominent, distally expanded or somewhat uncate processes; the succeeding four pairs also with coxal eminences, these decreasing in going caudad. Genotype.—H. *pulchrus*, sp. nov.

Hiltonius pulchrus, sp. nov.

General color bright brown with the caudal border of each segment annulate with black; collum bordered with black in front as well as be-

hind; head, antennae and legs brown. Sulcus of head widely interrupted in the frontal region. Clypeal foveolae 4+4. Upper clypeal region a shallow depression on each side. Antennae reaching to second segment. Collum moderately concave or excavated in front for reception of cardo of mandibles. Lower end rounded. Second segment extending well below level of collum on each side, the part below collum with lower and anterior margins straight. Surface of segments punctate, with fine, short, mostly longitudinal lines proceeding from the punctae. Covered part of prozonites with few but distinct transverse striae. Sutures distinct throughout, bending a little forward toward pores, which are small. Anal valves moderately protruding caudad but not at all margined; exceeding the anal scutum. The free inner edge of basal or coxal plate of anterior gonopods a little shorter than the length of the median plate, with a short blunt process at distomesal angle; the telopodite distally narrowly rounded, not at all bent or uncate. Posterior telopodites concave on posterior surface distally—distal end rounded, the edges finely dentate, the mesal edge with a prominent angle at proximal end of concave region; no free median or inner piece. Number of segments fifty-three.

Length (male), near 80 mm.; width, 8 mm.

Locality.—California: Claremont. (W. A. Hilton.)

ATOPETHOLIDAE, fam. nov.

In this family the anterior median plate of the gonopods of male is reflexed from distal end up on the caudal side, the caudal extension commonly continued above in more membranous form and coming into more or less intimate relationship with the bases of the posterior gonopods. Posterior gonopods with telopodite simple and mostly blade-like with no separate inner piece; basal region often more or less extended mesad at an angle suggestive of condition in the Trigoniulidae. In most forms, at least, the telopodite of anterior gonopods distinctly articulated; short and broad, with a finger-like or distally expanded process from distal or mesal edge. The members of this family are easily recognizable among other North American Spiroboloids by the form of the collum which is acutely narrowed on each side below; caudal margin nearly straight above these lateral processes, not much bowed caudad as in *Spirobolus*, etc.; while the second segment is not at all produced below the level of the collum. The family includes, in addition to *Atopetholus* and *Hesperolus*, the two new genera described below, also *Onychelus*, *Eurelus*, and related genera of the southwestern United States and Mexico.

Atopetholus, gen. nov.

In this genus the anterior median plate of the male gonopods is shorter and broader than in *Onychelus*. The telopodite of the anterior gonopods short and broad but exceeding the coxal plate; with a conspicuous, digitiform, distally moderately expanded and rounded process from the mesal or distal edge extending caudad more or less at right angles to the general

surface. Telopodite of posterior gonopods a rather slender, strongly chitinous, curved blade with broader basal region extended mesad; the telopodite much larger than in *Onychelus* and *Hesperolus;* at apex simply notched or with a small angle or tooth just proximad of the rounded apex. First two to four pairs of legs of male crassate and with the claws hypertrophied; other anterior legs with claws normal in size. Coxae of third legs of male with conspicuous, simple, subconical processes which do not exceed in size those of the coxae of the next four pairs. Mesal margins of anal valves meeting in a groove.

Genotype.—*A. californicus*, sp nov.

Atopetholus californicus, sp. nov.

General color brown with an annulus of black a little in front of caudal margin of each segment, the color along which remains light; legs dark brown, more fulvous proximally. Anal scutum and valves dusky or black. Collum also dusky, somewhat paler in median region. Sulcus of head complete, not interrupted. Setigerous foveolae, 5 + 5. Antennae reaching to third segment. Collum strongly narrowed ventrad, the lower end acute; margined in front up to level of eye on each side; anterior margin slightly concave opposite each cardo. Second segment on a level below with lower end of collum in male, often exceeded by latter in female. Segments furrowed along position of suture, which is not itself distinct. Several transverse striae in front of position of suture, the most caudal of these especially well marked and taking its origin low down on the side from the suture proper. Metazonites lightly finely punctate, the prozonites more vaguely so. Anal valves broadly convex, not compressed, caudally flattened. Claws of first two pairs of legs of male as long as last tarsal joint; those of other legs smaller, of normal or nearly normal size. Number of segments, forty-eight.

Length (male), near 52 mm.; width, 5 mm.

Locality.—California: Claremont. (W. A. Hilton.)

Atopetholus parvus, sp. nov.

Easily distinguishable, aside from coloration, much smaller size, etc., by the different structure of the gonopods of male. A conspicuous feature in these is that the telopodites of the posterior gonopods are much larger and protrude widely beyond the anterior gonopods, being bent caudad below and beyond telopodites of latter. The anterior median plate is similar but is distally narrower and extends farther distad. The telopodite of anterior gonopods shorter than in the genotype, somewhat semicircular in outline with the process arising from the distal edge, not from the mesal edge. Segments in general blackish; a narrow light stripe along caudal margin of each segment, especially in anterior region; the prozonites on sides and in a spot just above level of pore may be areolated with numerous small light dots. Collum over median region with a close network of dark lines over a fulvous background, a submarginal band of black all around; legs fulvous; anal scutum black except-

ing a narrow caudal border; anal valves dark. Sulcus of head narrowly interrupted in frontal region. Clypeal foveolae 5+5. Collum as in *californicus;* extending, in male, a little below level of second tergite. Segments with a sharply impressed stria across dorsum just caudad of covered region of prozonite much as in the preceding species. Surface similar. Claw of first legs in male as long as last joint, that of the second shorter. Number of segments, forty-two.

Length (male), near 27 mm.; width, 3.25 mm.

Locality.—California: Claremont (W. A. Hilton).

Atopetholus fraternus, sp. nov.

Easily separable from the two preceding species in the form of the male gonopods. The telopodite of the anterior gonopods is bent convexly forward at the side where it bears at the anterodistal angle a straight, simple, process additional to the caudally directed one arising from the distomesal edge behind, this feature at once separating it from the preceding species. The telopodites of the posterior pair proportionately larger than in *californicus* but smaller than in *parvus,* crossing in the middle line, rather broad, thin at the edges, concave above. Median plate straight across distal end, much exceeded by the coxal plates. Color dark olive gray with a deeper, black or dark olive annulus about the caudal border, the extreme edge, however, pale. Antennae dark olive to black. Legs dark brown. Sulcus of head interrupted in frontal region. Clypeal foveolae 5+5. Collum narrowed below as usual, the process narrowly rounded; concave or excavated on caudal side just above lower end and strongly concave in front opposite cardo as usual; margining sulcus in front not extending dorsad fully to level of eye, diverging from margin at upper end; surface subdensely finely punctate. Surface of segments in general similar to that of collum. Each segment constricted, the furrow rather wide, the pore lying in it and the suture at its caudal edge. Suture curved at level of pore. First two pairs of legs in male strongly thickened, their claws enlarged as usual; the third and fourth pairs of intermediate thickness and their claws corrrespondingly intermediate in size. Processes of coxae of third to seventh legs subconical, smooth, those of the third pair largest. Number of segments, forty-one or forty-two.

Length (male), near 33 mm.; width, 4 mm. Width of female, 5 mm.

Locality.—California: Friant. (R. V. Chamberlin.)

Hesperolus, gen. nov.

Resembling *Onychelus* and *Atopetholus* in general structure. Agrees with the former and differs from the latter in lacking processes on the coxae of the third and succeeding anterior legs in the male. Unlike *Onychelus* the claws in the male are especially large on only the first two pairs of legs, which are enlarged, the claws of the other anterior legs of normal size, or those of the third pair a little more elongate. Differ-

ing from both the genera mentioned in the greater simplicity and reduction of the telopodite of posterior gonopods, which is very short, distally rounded, not blade-like and not strongly chitinized. The anterior median plate distally broad much as in *Atopetholus* but extending farther distad. Coxal pieces of anterior gonopods broad, without processes. Telopodite of anterior gonopods distinctly articulated; narrowed distally into a short, distally rounded but not expanded process which lies in the general plane of the plate, not extending caudad from it as in *Atopetholus*.

Genotype, *H. wheeleri*, sp. nov.

Hesperolus wheeleri, sp. nov.

A species much smaller than those known in *Atopetholus* and *Onychelus* excepting *O. hospes*, an Arizonan species. From that species, aside from generic differences evident in the male, distinguishable in having the repugnatorial pore in front of the constricting furrow of the segment, not behind it. General color brown, the caudal borders and covered part of segments fulvous. Above level of pore on prozonite of each segment a large spot formed by small fulvous areas, a similar areolation of the prozonite in its anterior part down the sides. Anal scutum and valves dark excepting a narrow caudal border. Collum with black anterior and posterior bordering bands united below on each side. Head with a network of dark lines excepting a black area in frontal region, which sends a branch to each eye and bifurcates below. Clypeal foveolae 5+5. Sulcus of head widely interrupted in the frontal region. Antennae slender, the second article but little exceeding the third in length. Collum with anterior margin incurved opposite each cardo; lower angle or process curved back a little distance over the second segment, the posterior margin just above it being concave. Segments constricted caudad of middle, the furrows pronounced. Surface of segments in general smooth, punctate at most few and very vague. Anal valves broadly rounded, the mesal edges meeting in a pronounced groove. The coxal plate of anterior gonopods with distal margin nearly straight, its distomesal corner a little elevated, rounded; exceeding the median plate a little. Number of segments, forty.

Length (male), about 24 mm.; width, 2.8 mm.

Locality.—California: Santa Ynez Mountains, Cold Spring Canyon. (W. M. Wheeler).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SELAGINELLA FROM OKLAHOMA AND TEXAS.*

BY WILLIAM R. MAXON.

Among a few pteridophytes from Oklahoma recently received for identification are specimens of a new Selaginella, described below. An examination of herbarium material discloses other specimens from Texas and Oklahoma under cover of *S. Wrightii*, with which species there is no close relationship.

Selaginella Sheldoni Maxon, n. sp.

Plants prostrate, the main stems up to 10 or 12 cm. long, everywhere rooting, densely pinnately branched, the lower branches often spreading, up to 4 cm. long, mostly bipinnate, the ultimate branchlets in general short, simple or with very short knoblike divisions, sterile, or the apical ones often fertile to their base; stems, branches, and minor divisions all densely leafy, the leaves mostly curving upward, giving a definite dorsoventral aspect to the plant. Leaves crowded, imbricate, those of the under side appressed, soon discolored, the others secund or at first spreading, all herbaceous, grayish green, plane above, convex beneath and very narrowly sulcate to the apex, subulate to lance-subulate, setigerous at the acutish apex (the seta slender, white, persistent, 0.6 to 0.8 mm. long, serrulate), ciliate throughout, the cilia 7 to 10 on each side, the lower and middle ones the longest (0.14 to 0.2 mm. long), whitish, widely oblique, straight or falcate, the upper ones shorter, ascending, passing into elongate hyaline serratures at the apex; leaves of the under ranks (seta included) 2.4 to 2.7 mm. long, 0.4 to 0.5 mm. broad, the others slightly shorter. Spikes few, arcuately ascending, 8 to 12 mm. long, 1 to 1.3 mm. in diameter; sporophylls ovate to narrowly deltoid-ovate, long-acuminate, short-auriculate, very narrowly sulcate along the dorsal keel, short setigerous at the tip (the seta 0.3 to 0.5 mm. long, pungent, serrulate), short-ciliate, the cilia 16 to 22 on each side, whitish, the basal ones 0.07 to 0.09 mm. long, spreading, those above shorter, oblique, passing into pungent ser-

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ratures; larger sporophylls (seta included) 1.7 to 2.3 mm. long, averaging 0.9 mm. broad. Megasporangia few, basal and mostly ventral; megaspores about 0.45 mm. in diameter, yellow, delicately reticulate, the narrow low ridges and the broad surfaces of the areoles smooth; microspores bright yellow to orange, up to 0.055 mm. in diameter, granulose.

Type in the United States National Herbarium, no. 48,133, collected on Quanah Mountain, Oklahoma, July 28, 1891, by C. S. Sheldon (no. 233); originally listed* as *S. rupestris* (L.) Spring.

The following additional specimens of *S. Sheldoni* are in the National Herbarium:

Oklahoma: Headquarters Mountain, near Granite, on barren granite, May 4, 1918, *F. C. Greene;* Chickasha, on sandstone, June 10, 1918, *F. C. Greene.*

Texas: Crab Apple Creek, Gillespie County, *G. Jermy* 343; Murphysville, July, 1883, *V. Havard;* Alpine, Brewster County, March 7, 1918, *E. O. Wooton.*

Of the species known from the United States *Selaginella Sheldoni* might be confused only with *S. Wrightii*, of the Mexican Border region, which it resembles in its prostrate habit and recurved sterile branchlets. The resemblance is only superficial, however, *S. Wrightii* differing in all essential characters. The stems of the latter are shorter; the leaves are chartaceous, decidedly greener, and much longer (up to 3.5 mm. long), have the attenuate apex tipped by a short, stiff, lutescent seta, and bear longer and more numerous cilia; the spikes are about twice as long as those of *S. Sheldoni;* the sporophylls are narrower and longer and bear a shorter seta and more numerous cilia; and the megaspores are not only one-third smaller but strongly flexuose-rugulose, in marked contrast to the delicately reticulate megaspores of *S. Sheldoni.* In megaspore and other characters *S. Sheldoni* is related, apparently, to a small subgroup of Mexican species, several of which are undescribed.

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* Contr. U. S. Nat. Herb. **1**: 201. 1892.

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PROCEEDINGS

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POLYCHAETES FROM MONTEREY BAY.

BY RALPH V. CHAMBERLIN.

The small collection of annelids listed below was made by the writer in July of 1909 incidentally to other work. The material was secured at or near Pacific Grove along shore or at only moderate depths. Several of the records are new for the locality and five of the species have seemingly not been described before. The types of the new forms are deposited in the Museum of Comparative Zoology at Cambridge.

AMPHINOMIDÆ.

1. **Eurythoe pauper** (Grube).

Amphinome paupera, Vid. meddel, naturh-Foren. Kjoben., 1856, p. 52.

Eurythoe californica Johnson, Proc. Cal. acad. sci., ser. 3, zool. 1, 1897, p. 159.

Numerous specimens of this species which is widespread on the Pacific coast of the Americas.

POLYNOIDÆ.

2. **Halosydna insignis** (Baird).

Lepidonotus insignis Baird, Proc. zool. soc. London, 1863, p. 106.

Abundant material of this common species, many being of the melanistic type.

3. **Halosydna californica** (Johnson).

Polynoe reticulata Johnson, Proc. Cal. acad. sci.; ser. 3, zool. 1,1897, p. 170, pp. 7, f. 32, 41-41a and pl. 8, f. 47-47b.

Polynoe californica Johnson, Proc. Boston soc. nat. hist., 1901, p. 387.

4. **Harmothoe imbricata** (Linné).

Approdita imbricata Linné, Syst. nat., ed. 12, 1766, p. 1084.

5. **Lepidonotus coeloris** Moore.

Proc. acad. sci. Phil., 1903, p. 412, pl. 23, f. 12.

SYLLIDÆ.

6. **Syllis alternata** Moore.

Proc. acad. sci. Phil., 1908, p. 323.
One specimen.

NEREIDÆ.

7. **Nereis procera** Ehlers.

Die Borstenwürmer, 1868, p. 557, pl. 23, f. 2.

8. **Nereis mediator** Chamberlin.

Pomona coll. journ. ent. and zool., 1919, 11.
A species previously known from Laguna Beach and San Diego, Cal.

9. **Nereis mendocinana** Chamberlin.

Previously known from Mendocino, Cal.

10. **Nereis (Neanthes) monterea,** sp. nov.

Apparently the only species thus far known from the Pacific Coast in which all areas of the proboscis are armed and of the Neanthes type. In area I a single conical tooth which is very much stouter than those of other areas of the maxillary ring. On each area II in the type are six denticles in three transverse rows, the arrangement, beginning with the distal series, being 1, 2, 3. On III are numerous denticles in typically four transverse series; the denticles of the two middle series obviously stouter than those of the others; example of arrangement, 3, 4, 9, 9. Denticles of IV also numerous, in a patch elongate in a longitudinal direction, typically in five series, with five denticles in each. A single stout tooth like that of I in area V. In VI a still larger conical tooth which is usually compressed in the distoproximal direction, plate-like. Denticles of VII and VIII forming a continuous band across sides and ventral region of ring, the band a single series at sides but composed of two or three denticles below, the denticles much larger than those of the maxillary ring excepting that of I. Prostomium in length about equalling the first two segments together, a little longer than width across base; posterior oculiferous region subquadrate, broader than the longer anterior region, which is more depressed, flatter, and is separated from the basal by a transverse depression, its anterior end convex. Tentacles separated by about their radius, conical, short, less than half the length of prostomium and often not more than a third. Anterior eyes a little longer than the posterior, from which well separated, and a little farther apart. Palpi very stout, outline of the two joints smoothly continuous, the terminal one short, strongly rounded, hemispherical. Peristomium about once and a half the length of II, much longer below, on sides and ventrally crossed by numerous oblique furrows. Dorsal

posterior tentacular cirri the longest, but these reaching only to III. In anterior parapodia the lobes are thick and notably rounded, particularly those of the notopodia, the neuropodial subsetigerous lobe smaller than the two notopodial lobes and more narrowed distad, less hemispherical. In passing caudad the notopodial lobes become more elongate and more conically pointed with notocirri still dorsal in position. In continuing caudad the dorsal notopodial lobe becomes still more elongate and its notocirrus shifts toward the tip, leaving beyond its base only a short, finger-like process. The neuropodial lobe in the anterior parapodia is very stout like the notopodial lobes; but in going caudad it becomes notably reduced. Neurocirrus attached at base of neuropodium, where there is a conspicuous transverse swelling, subulate, surpassing the neuropodial lobe. Setae of usual general types. Anal cirri subulate, moderate, equalling the last six or seven somites in length.

Number of somites near 130.

Length up to 140 mm.; greatest width, exclusive of parapodia, up to 7 mm.

11. **Nereis agassizi** Ehlers.

Die Borstenwürmer, 1868, p. 542, pl. 23, f. 1.

LEODICIDÆ.

12. **Marphysa stylobranchiata** Moore.

Proc. acad. sci. Phil., 1909, p. 249, pl. 7, f. 8-12.

Many specimens.

13. **Leodice enteles,** sp. nov.

In this species the branchiæ begin either on VIII, as most commonly, or on IX as single terete filaments or sometimes as two, either on one side only or on both. On the next segment two filaments, and on several succeeding ones three, the number increasing in going caudad to a maximum of four, or five, counting the shorter continuation of the basal stalk. The filaments are attached in one series along the stalk to which they are moderately oblique. On XXXIV in the type the number of branches again reduced to two, which number prevails also on the next four or five segments, after which the branchiae are simple filaments, continuing as such to the end of the body or obsolete on the four or five last pairs of parapodia. The tentacles are all strongly moniliform with the proximal joints stoutest and narrowest, the tentacles being constricted toward base, widening to end of proximal third or so of length and then moderately narrowing distad, the last joint well rounded; readily broken off at ends; cirratophores very short. A median tentacle retaining seventeen articles reaches to somite VI. A posterior paired tentacle retaining fifteen articles reaches to V. Prostomium with a deep V-shaped median incision in anterior border. Palpi thick, hemispherically rounded. Eye ectad of posterior paired tentacle and caudad of anterior paired tentacle. Nuchal cirri shorter than peris-

tomium; subulate, with smooth outline, with only obscure indications of annulation or none at all, when present these in distal half. Notocirri slenderly conical, segments few and usually only weakly separated. Anterior neurocirri very large and thick with a much reduced terminal article; becoming slender in going caudad. Anal cirri two, attached close together on ventral side of the circular anal opening, stout and showing a division into four or five long articles. The remaining portion of the border of anus shows about a dozen weak crenations. Maxillæ pale excepting anterior and mesal margins of carriers of I, which are black, and the teeth of the other plates, which are brown. Right plate II with about thirteen teeth, of which the most proximal are much smaller than the others; ectal left plate II with about thirteen teeth, of which the most proximal are much smaller than the others; ectal left plate II with long smooth proximal edge distad of which are five or six teeth; unpaired or mesal left plate II with seven teeth; right maxilla III with eleven teeth; left maxilla III also with ten or eleven. Number of segments one hundred and twenty-seven to one hundred and forty.

Length up to 110 mm.; greatest width, 4.5 mm. Body strongly tapering caudad.

14. **Leodice valens** Chamberlin.

Previously known from Mendocino, Cal.

LUMBRINEREIDÆ.

15. **Lumbrinereis erecta** Moore.

Proc. acad. sci. Phil., 1904, p. 490, pl. 37, f. 19-22; pl. 38, f. 23-25.
A common species in this region.

16. **Lumbrinereis zonata** Johnson.

Proc. Boston soc. nat. hist., 1901, p. 408, pl. 9, f. 93-100.
Many small specimens probably the young of this species.

17. **Arabella munda** Chamberlin.

Several specimens agree well with the type, which was taken at Mendocino. In these the right maxilla II is even more strongly dentate than in the type, the number in one specimen being fourteen or fifteen, of which two ordinary teeth lie distad (i. e., ectad) of the large anterior fang-like tooth. In this feature, according to Treadwell's description, differing strongly from *A. attenuata*.

DORVILLEIDÆ.

18. **Dorvilleia moniloceros** (Moore).

Stauronereis moniloceros, Proc. acad. sci. Phil., 1909, p. 256, pl. 8, f. 24-29.

Three specimens. This is the type locality for the species.

ARICIIDÆ.

19. **Nainereis nannobranchia** Chamberlin.

One specimen. Previously known from Mendocino.

20. **Nainereis longa** Moore.

Proc. acad. sci. Phil., 1909, p. 264, pl. 8, f. 38-42.
This is the type locality for this species.

GLYCERIDÆ

21. **Glycera robusta** Ehlers.

Die Borstenwürmer, 1868, p. 656, pl. 24, f. 31, 32.
A rather common species in this region.

22. **Glycera rugosa** Johnson.

Proc. Boston soc. nat. hist., 1901, p. 411, pl. 10, f. 105, 103a.

23. **Glycera nanna** Johnson.

Proc. Boston soc. nat. hist., 1901, p. 411, pl. 10, f. 103, 103a.

CIRRATULIDÆ.

24. **Audouinia spirobranchus** (Moore).

Cirratulus spirobranchus, Proc. acad. sci. Phil., 1904, p. 492, pl. 38, f. 26 and 27.

One specimen of this species, like the type, is near 105 mm. in length but is more robust, having a maximum diameter of 7 mm.

Ambo, gen. nov.

Characterized in bearing special or dorsal branchiæ on a large number of segments beginning with the first setigerous or the one preceding it, with the principal groups on a segment caudad of the first setigerous as in Audouinia.

Genotype.—*A. perbranchiata,* sp. nov.

25. **Ambo perbranchiata,** sp. nov.

Characterized by the arrangement and large number of the branchiæ. The principal groups of these occur on the fifth setigerous segment, where they form a dense multiseriate band continuous across dorsum, no middorsal interval being evident. Special branchiæ also occur on about thirty succeeding somites, the two groups, unlike those of the fifth setigerous segment, being widely separated by a middorsal naked area. The number of branchial filaments in each group on these segments from four or five down to two. Branchiæ of the same group often very different in thickness and length, some, possibly regenerating, being very slender and short. A few special or dorsal branchiæ also occur on all the setigerous somites in front of the fifth, there being a single special cirrus on each side of the first setigerous segment. In going caudad from the region where only single cirri occur on each side, the cirri come to occur first

on every other segment on a side and alternately with those of the opposite side; farther caudad two and three or more segments come to intervene between the successive branchiferous ones, the number intervening in posterior region becoming very large. Branchiæ assuming a high dorsal position in going caudad as usual. On the segment preceding the first setigerous one occurs also two slender tentacular cirri, one arising on each side from caudal edge of segment in front of branchiæ of succeeding segment; these tentacular cirri filiform, much more slender and shorter than the typical branchiæ, each reaching to near anterior end of prostomium in the type, but in one paratype much longer. Special branchiæ of principal groups commonly strongly coiled, the longest branchiæ 25 and 30 mm. long. Neuropodia and notopodia widely separated. Crochets of neuropodia stout and black, first occurring on or adjacent to the nineteenth setigerous segment, mostly three or two but sometimes four in each series. Body dark brown with a bluish black pigment tinging anterior end of body; series of dark spots along each side, one spot present at base of each neuropodium and notopodium. The special branchiæ of the principal group typically also colored with this dark pigment except proximally, sometimes annulated, contrasting strongly with the other branchiæ which are yellow.

Number of segments near two hundred and eighty.

Length up to 210 mm.; greatest width, 6 mm.

26. **Ambo convergens,** sp. nov.

Dark colored like *perbranchiata,* but the bluish black pigment diffused over entire body, making this in general a notably deeper color; a deep blackish longitudinal stripe just mesad of bases of neuropodia. Some of branchiæ, particularly those of principal special groups, dark beyond proximal yellow region, the other branchiæ mostly yellow. Principal groups of special branchiæ on the seventh setigeous segment, the group on each side tending at ectal end to encroach on the preceding segment; about twenty-five branchiæ in each group, the groups well separated by a middorsal naked area. On segments in front of this the number of branchiæ additional to the ordinary one on each side from one to three, on segments caudad of the seventh setigerous mostly, but one additional and only single branchiæ occur caudad of about the twenty-ninth setigerous segment. Branchiæ caudad of this region few, mostly widely separated with numerous segments between successive ones. Neuropodial crochets stout and black, first appearing in the twentieth setigerous segment on which and about forty following ones they number two, or very rarely three, on each side, and thereafter but a single one occuring in each neuropodium.

Number of segments near two hundred and sixty-five, these very short and closely crowded.

Length, 75 mm.; greatest width, 6 mm.

CAPITELLIDÆ.

27. **Notomastus pallidior,** sp. nov.

In general form differing from *N. tenuis* Moore and agreeing with *N. angulatus* Chamb. in having the thorax decidedly quadrate rather than terete. No abrupt enlargement at beginning of abdomen, the thorax passing gradually into abdomen. Contrasts strongly with *N. angulatus* in color, being yellow instead of a dense green. Prostomium less strictly conical than in angulatus, the palpoidal terminal division abruptly narrower than the basal and distally rounded, the sides in ventral view convex; surface not showing numerous fine points as usual in *angulatus*. Ventral surface of peristomium with a large V-shaped impression formed by two sulci arising from near anterior margin on sides and meeting at an angle on the midventral line at the caudal margin. The peristomium subcylindrical or only moderately narrowed cephalad, at anterior end abruptly much wider than prostomium. Thorax composed of twelve setigerous somites. All these clearly biannulate, the separating sulci strongly marked, especially laterally; a longitudinal furrow along each side. Most thoracic segment showing a vague division of anterior subsegment. Posterior subsegments much shorter than the anterior, in the last segment only half as long. None of the types is complete. The longest one has about one hundred and thirty segments present, of which those in the middle region are longer than wide. The total length of this specimen is 78 mm. with a maximum width of about 1 mm.

Several specimens were taken.

SCALIBREGMIDÆ.

28. **Sclerocheilus pacificus** Moore.

Proc. acad. sci. Phil., 1909, p. 282, pl. 9, f. 59.
One specimen.

TEREBELLIDÆ.

29. **Thelepus crispus** Johnson.

Proc. Boston soc. nat. hist., 1901, p. 428, pl. 17, f. 175-178b.
Common in this region.

SABELLIDÆ.

30. **Pseudopotamilla brevibranchia** Moore.

Proc. acad. sci. Phil., 1905, p. 555, pl. 37, f. 1-7.

Numerous specimens of this species and their tubes are in the collection. Some of these are variant in having the eyes almost or wholly obliterated. One specimen has nine and one ten setigerous somites in place of the usual eight.

31. **Eudistylia polymorpha** (Johnson).

Bispira polymorpha, Proc. Boston soc. nat. hist., 1901, p. 429, pl. 17, f. 179-183 and pl. 18, f. 184-185.
Numerous specimens with their tubes.

SERPULIDÆ.

32. **Serpula vermicularis** Linné.

Serpula columbiana Johnson, Proc. Boston soc. nat. hist., 1901, 29, p. 432, pl. 19, f. 199-204.

SABELLARIIDÆ.

33. **Sabellaria californica** Fewkes.

Bull. Essex Inst.; 1889, 20, p. 130, pl. 7, f. 3 and 4.
Many specimens.

34. **Sabellaria cementarium** Moore.

Proc. acad. sci. Phil., 1906, p. 248, pl. 12, f. 45-51.
Three large specimens.

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PROCEEDINGS

OF THE

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NEW MARINE MOLLUSKS FROM THE PHILIPPINE ISLANDS.

BY PAUL BARTSCH.*

Among a lot of marine mollusks submitted to the United States National Museum for determination by correspondents from the Philippine Islands, are a number of new forms. Most of these were discovered by Mr. C. M. Weber, in the southern Palawan region, while the beautiful little *Columbella deveyrai* comes from the Batanes Island, in the northern end of the Archipelago.

Oliva episcopalis philippinensis, new subspecies.

Two *Olivas*, Cat. No. 219,048, U. S. N. M., collected by Mr. Weber at Bancalan and Balabac Islands, differ decidedly from the typical form, being much smaller and more elevated and also more darkly colored. I therefore believe that they merit subspecific distinction. Both of them have lost the extreme tip.

The type has seven whorls remaining, and measures: length, 41.8 mm.; diameter, 17.1 mm. The other specimen, which has 6.5 whorls remaining, measures: length, 40.6 mm.; diameter, 17.5 mm.

Oliva tricolor palawanensis, new subspecies.

Mr. Weber has sent us two very remarkable shells from Roughton Island, Collector's No. 83A, Cat. No. 219,049, U. S. N. M. These, while agreeing with *Oliva tricolor* in outline, completely lack the olive green ground color peculiar to that species. This is replaced by a creamy white tint; the rest of the markings are axial rows of dots of yellow and blue. The maculations on the spire are similar to those of the typical form. The interior is deep purple. This form is so striking that I deem it desirable to bestow a name upon it.

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Were it not for the deep purple interior, I would be inclined to consider these albinistic specimens of *Oliva tricolor*, but the color of the interior leads me to believe that we are dealing with a distinct race.

Mitra nigritella, new species.

Shell very elongate ovate, very dark brown excepting a narrow white zone which encircles the whorls immediately above the periphery. Nuclear whorls well rounded, feebly, roundly shouldered at the summit. Postnuclear whorls marked by rather strong moderately broad, almost vertical axial ribs, which are eroded on the earlier turns but of which eighteen occur upon the fourth, twenty upon the remaining turns, of the type. In addition to the axial ribs which extend feebly to the very apex of the base on the last turn, the entire surface is marked by fine lines of growth. The spiral sculpture consists of slightly sinuous threads which are equal and sub-equally spaced. Of these threads, eight occur between the summit and the suture on the last turn. Suture strongly marked. Base marked in addition to the continuations of the axial ribs on the anterior half by nine spiral threads equalling those of the spire in strength and on the anterior half by six cords, which are much stronger and more distantly spaced, and which render their junctions with the ribs slightly nodulose. A strong tumidity encircles the base at the anterior columellar fold. Aperture narrow; posterior angle acute, decidedly channeled anteriorly; outer lip somewhat sinuous; inner lip reflected over and appressed to the base, provided with three oblique folds which decrease in size successively from the posterior anteriorly; parietal wall covered by a moderately thick callus, which is of equal strength throughout its extent.

The type and another specimen of this species, Cat. No. 219,054, U.S. N. M., Coll. No. 110, were collected by Mr. Weber at Bugsuk Island. The type has 7 whorls remaining and measures: length, 17.2 mm., diameter, 7.1 mm.

Mitra palawanensis, new species.

Shell elongate ovate, Sanford brown, a little paler at the tip. Nuclear whorls decollated in all of our specimens. Postnuclear whorls well rounded, marked by strong spiral keels which are slightly flattened on their summit. Of these keels, three occur between the summit of the whorls and the suture on the early whorls; the summit gradually dropping on the whorls permits a fourth one to be present on the spire of the last turn. The first of these keels, which are equally spaced, is almost as far from the summit as it is from its anterior neighbor. The spaces between the spiral keels, which are about twice as wide as these, are shallow grooves. In addition to the spiral sculpture the whorls are marked by numerous closely spaced, slightly, retractively slanting, incised lines which pass over the spiral keels, but are best marked in the depressions. Periphery of the last whorl well rounded. Base rather elongated, slightly concave in the middle, marked by spiral keels of which six equal those of the spire in strength and spacing. These occupy the posterior two-thirds of the base. Five

additional, much stronger and much more closely spaced cords are crowded on the anterior part of the columella. The incised axial lines referred to on the spire continue over the base. Aperture irregularly very elongate oval; outer lip rendered sinuous by the external ribs, reinforced within by a thick callus; inner lip provided with four oblique folds, which decrease regularly in size from the posterior anteriorly, the last one being only feebly indicated; parietal wall covered by a moderately thick callus.

The type and three specimens of this species, Cat. No. 219,057, U. S. N. M., Collector's No. 122, were collected by Mr. Weber at Brooke's Point, Palawan. The type, which has lost the nucleus, has 6.5 whorls remaining, and measures: length, 14.5 mm., greater diameter, 7.1 mm. One of the four specimens, which has also lost the nucleus and some of the early postnuclear whorls, is considerable larger. It has 6.5 whorls remaining and measures: length, 18 mm.; greater diameter, 8.9. mm.

This species belongs to the group of *Mitra chrysallis* Reeve and *Mitra pregra* Reeve. The National Museum collection also contains two specimens, Cat. No. 32,030, collected by the author at Cataingan Bay, Masbate.

Mitra amanda, new species.

Shell ovate, spire rather short, surface marked by more or less wavy alternating bands of dark chocolate brown and buff. Nuclear whorls decollated in all our specimens, the succeeding turns forming a not very tall, rather broad spire. Whorls strongly rounded, almost appressed at the summit, the early turns marked by about three incised spiral lines which separate the space between the summit and the suture into three equal areas and from there on, the whorls are divided into four subsequal spiral zones above the suture. Periphery slightly rounded, base rather long, only very slightly concave, marked by weak, very broad spiral cords which become successively stronger from the periphery anteriorly, excepting the last four, which again are decidedly weaker; there are nineteen of these cords present. In addition to the above sculpture, the entire surface of the shell is marked by rather strongly wavy incremental lines which extend from the summit to the tip of the base. Aperture irregularly elongate oval, decidedly channeled anteriorly, the posterior angle acute; outer lip very much thickened within, somewhat sinuous, rendered wavy by the cords in its anterior half; inner lip reflected over and appressed to the base, provided with four oblique folds which become successively smaller from the posterior, anteriorly. The anterior termination of the inner lip has the appearance of a fifth fold; parietal wall covered by a moderately thick callus. The inside of the outer lip is dark chocolate brown over the anterior three-fourths, while the posterior fourth is bluish white within, edged with chocolate. The columellar folds are bluish white. The rest of the inner lip is dark.

The type and five specimens of this species, Cat. No. 221,815, U. S. N. M., were collected by the author at Dumurug Point, Cataingan Bay, Masbate. The type has lost the extreme tip. The nine whorls remaining measure: length 22.5 mm.; greater diameter, 11.4 mm.

The present species seems to be abundantly represented in the Philippines, and it seems strange that it has been overlooked in the past. It is quite possible that it has been confused with *Mitra paupercula Linnaeus*, from which it is at once distinguished by its less elongate outline and by the presence of the spiral cords which are absent in *paupercula*. It is quite distinct from *M. tigrina* Sowerby, *M. litterata* Lamarck, *M. tornatelloides* Reeve, and *M. virgata* Reeve, which belong to the same group.

We have seen the following additional specimens: Cat. No. 231,815, U. S. N. M., 6 specimens, Cat. No. 231,814, U. S. N. M., 2 specimens, all from Cataingan Bay, Dumurug Pt., Masbate; Cat. No. 231,851, U. S. N. M., 1 specimen from China Sea, Now Wow, Formosa; Cat. No. 231,867, U. S. N. M., 10 specimens from Sabtan Island, Batanes Group; Cat. No. 232,026, U. S. N. M., 1 specimen from Capunuypugan Pt., Mindanao; Cat. No. 231,818, U. S. N. M., 1 specimen from Panabutan Bay, Mindanao; Cat. No. 231,871, U. S. N. M., 2 specimens from Silino Island, Mindanao; Cat. No. 232,034, U. S. N. M., 2 specimens from Little Santa Cruz Island, Mindanao; Cat. No. 231,860, U. S. N. M., 1 specimen from Port Ciego, Balabac; Cat. No. 253,699a, U. S. N. M., 1 specimen from the Philippine Islands.

Mitra arnaloti, new species.

Shell very elongate ovate, white, with numerous axial bands and blotches of rust brown, which increase in width and almost completely cover the last whorl, excepting the periphery, which is encircled by an almost continuous broad white zone, the tip of the base also being white. Nuclear whorls decollated, those succeeding increasing at first gently, then a little more abruptly in size, which lends the extreme apex a slight mucronate aspect. The whorls are marked by five moderately broad low, well rounded cords, which are separated by spaces a little wider than the cords. The first of these is at the summit and the last immediately above the suture. These cords become decidedly enfeebled on the last half of the last turn. In addition to these cords, the whorls are marked by numerous small vertical axial riblets, which differ markedly in strength and spacing. At times they appear almost as varices. On the first four whorls the riblets are reduced to almost incremental lines, but they increase steadily in size beyond this to the last half of the last turn, on which they again become enfeebled. Of these riblets, 56 occur upon the antipenultimate turn. In addition to the above sculpture, the entire surface is marked by exceedingly fine incremental lines and equally fine spiral striations, the combination of the two lending the surface a finely reticulated cloth-like texture. The narrow shouldered summit of the whorls renders the suture well marked. Periphery inflated, well rounded. Base decidedly concave in the middle, marked by the continuations of the axial riblets, which become reduced to mere lines of growth at the anterior portion of the spiral cords; the latter become successively stronger from the periphery to the anterior portion of the base. There are about 22 of these on

the base. Aperture of irregular outline; posterior angle acute, decidedly channeled anteriorly; outer lip reinforced within by a strong callus; inner lip provided with five oblique folds which grow successively weaker from the posterior anteriorly; parietal wall covered by a rather thick callus.

The type and another specimen of this species, Cat. No. 231,946, U. S. N. M., were given to the writer by Father Arnalot, at Davao, Mindanao. The type has lost the nuclear tip. The ten whorls remaining measure: altitude, 35.5 mm.; greater diameter, 15 mm. Another specimen, Cat. No. 231,937, U. S. N. M., was also collected at Davao, Mindano, by Dr. Mearns. We have seen two additional specimens of this species in the Hon. Jaime C. de Veyra's collection from the Philippines, without specific locality data.

This species is a member of the *Mitra ferruginea* Lamarck complex. It differs from that species by having all the sculpture, both axial and spiral, much more feebly expressed, and the aperture proportionately larger.

Turricula weberi, new species.

Shell of medium size, elongate conic, tip dark with a narrow dark zone at the suture and a broad dark band extending from the periphery over the posterior half of the base. This dark band really consists of two darker elements separated by one of about equal width, of a little lighter shade. Nuclear whorls decollated. Postnuclear whorls moderately rounded, feebly shouldered at the summit, marked by strong, well rounded axial ribs, of which eighteen occur upon the first and second of the remaining turns in the type, twenty upon the third to sixth, and eighteen upon the penultimate turn. These ribs are almost vertical and are about as wide as the spaces that separate them on the early turns, while on the last turn they are much less so. In addition to the axial ribs the entire surface is marked by strong incremental lines. The spiral sculpture consists of strong incised spiral grooves which run equally strongly over the intercostal spaces of the ribs and give to the latter, particularly in the last turn, a somewhat granular appearance. Of these incised spirals, a single only occurs upon the first two turns, while upon the third two are present, the fourth contains three, the fifth seven, the sixth eight, which is also the number between the summit and the periphery on the last turn. On this they are equally spaced, while on the other turns the spacing is irregular. Periphery of the last whorls well rounded. Base slightly contracted in the middle, the anterior half marked by the continuation of the axial ribs, and twelve incised spiral lines which equal those on the spire in strength, but are not as regular in spacing. The anterior half of the base is marked by a strong keel in its middle, the prominent portion of which is almost parallel to the third columellar fold. In addition to this, there are five strong spiral cords posteriorly, and three anteriorly. Aperture of irregular outline, posterior angle acute, decidedly channeled anteriorly; outer lip thin, somewhat sinuous; inner lip reflected and appressed to the base, forming a narrow umbilical chink at the extreme anterior end, pro-

vided with four strong oblique folds, of which the posterior is the strongest, while the other three decrease in size successively; parietal wall covered with a thin callus except at the posterior angle of the aperture, where it is decidedly thickened.

The type and another specimen of this species, Cat. No. 219,052, U. S. N. M., Collector's No. 107, were collected by Mr. Weber at Bancalan Island. The type has lost the nuclear tip and probably the first one and a half postnuclear turns. The seven and a half remaining whorls measure: length, 27.2 mm.; greater, 10.9 mm.

Turricula bancalanensis, new species.

Shell small, elongate ovate, the spire flesh colored except the narrow dark zone on the suture; in the last whorl the posterior half of the whorl is encircled by a light brown band, the rest of the shell being flesh colored. Nuclear turns one and a half, strongly rounded, smooth, forming a somewhat mamillated apex. Postnuclear turns roundly shouldered at the summit, well rounded, marked by strong, broad, slightly protractive axial ribs, of which sixteen occur upon the first to fifth, fourteen upon the sixth, and twelve upon the penultimate turn. These ribs become slightly enfeebled at the summit, and evanesce on reaching the anterior half of the base. In addition to the axial ribs the entire surface of the shell is marked by very fine lines of growth. The spaces between the ribs are a little wider than the ribs and are crossed by three incised pits between the summit and the suture, the space between the summit and the first being the widest, while that between the first and second equals the space between the suture and the third in width, the space between the second and third being a little wider than the last named. Suture strongly marked. Base rather prolonged, slightly concave at the insertion of the columella, the posterior third marked by six incised spiral lines, which are less regularly spaced than those on the spire. The anterior two-thirds of the base is marked by eight irregular, broad, low, rounded spiral cords. Aperture irregularly elongate oval, posterior angle acute, decidedly channeled anteriorly; outer lip thin, somewhat sinuous; inner lip provided with four oblique folds of which the posterior is the strongest, the others becoming successively weaker; parietal wall covered by a thin callus anteriorly, and a much thicker one at the posterior angle of the aperture.

The type and two immature specimens of this species, Cat. No. 219,053, U. S. M. N., were collected by Mr. Weber at Bancalan Island. The type has 8.5 whorls and measures: length, 10.6 mm.; greater diameter, 4 mm.

Columbella deveyrai, new species.

Shell small, ovate, marked by alternating irregular axial zigzag bands of white and blackish brown, which are of about equal width. Nuclear whorls decollated. Postnuclear whorls strongly rounded, inflated, smooth excepting fine incremental lines. Suture strongly constricted. Periphery of the last whorl inflated. Base rather long, concave in the middle, the

extreme posterior portion smooth, the anterior three-fourths marked by twelve incised spiral lines which become irregularly more closely spaced from the suture anteriorly, and the spaces between them become regularly more elevated, forming broad low rounded cords in the columellar region. Aperture irregular, decidedly channeled anteriorly, posterior angle obtuse; outer lip somewhat sinuous, reinforced by a strong callus within, which bears twelve strong oblique denticles; columella with two oblique folds. The extreme outer edge of the columellar callus provided with seven strong denticles; parietal callus becoming thickened toward the posterior angle of the aperture.

The type, Cat. No. 310,052, U. S. N. M., comes from the Batanes Islands. It has 5 whorls remaining, and measures: altitude, 9.4 mm.; greater diameter, 5.7 mm.

I take great pleasure in naming this species for the Hon. Jaime C. de Veyra, Resident Commissioner from the Philippine Islands, whose interest in the natural history of our island possessions is aiding materially in increasing our knowledge of their faunas.

Sigaretus weberi, new species.

Shell decidedly depressed, lenticular, pale yellow with a suffusion of rusty red on the last turn. Nepionic whorls well rounded, smooth, very small, the first turn and a half pale brown, the rest white. The nepionic portion appears to coil very regularly and the turns increase but slightly in size, while the whorls of the succeeding turns increase exceedingly rapidly in width. Immediately after the nepionic whorls the upper surface of the whorls becomes marked by numerous, closely crowded incremental lines, which appear as slender threads under the microscope and in addition to this by very numerous very fine raised threads, the combination of the two forming a clothlike texture. On the last quarter of the last turn the spiral element becomes evanescent. The spiral sculpture is not at all apparent to the naked eye on any part of the upper surface. Periphery of the last whorl with a well rounded angle. Base marked by numerous incremental threads, but without microscopic spiral sculpture. Aperture, considering the outlines of the lips only, broadly oval, the outer lip projecting as a broad clawlike element, while the inner lip is evenly curved and very slightly reflected. If one looks at the shell absolutely vertically the twist of the columellar edge appears as a slight perforation that extends to the apex of the shell; parietal wall glazed with a thin callus.

The type and another specimen, Cat. No. 219,050, U. S. N. M., were collected by Mr. Weber at Alfonzo XIII, Palawan. The type has 4.1 whorls and measures: altitude, 7.1 mm.; greater diameter, 27.6 mm.; lesser diameter, 18.6 mm.

The National Museum collection contains this species from two other localities; namely, Cat. No. 243,278b, U. S. N. M., Pasig Beach, Manila, and Cat. No. 240,292, U. S. N. M., Port Carlton, Busuanga. It is possible that this is the shell which has been passing under the name of *Turricula planulata* Recluz, which is an entirely different species, having its home in the Seychelle Islands.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

SOME WESTERN SPECIES OF LATHYRUS.

BY C. V. PIPER.

In connection with economic investigations of species of Lathyrus it has been necessary to study some western species critically. Several of these species show wide variation in the characters of the leaflets, stipules and also of the tendrils, so that such differences do not justify the valuation which some botanists have placed upon them. Pubescence when present seems on the other hand to be a fairly stable characteristic, but now and then specimens occur which apparently are glabrous forms of species usually pubescent.

Lathyrus ochropetalus, n. sp.

Perennial, wholly glabrous, slightly glaucous; stems slender, angled or very narrowly winged, 1-1.5 m. high; leaves with 3 to 10 mostly 8 leaflets and well developed tendrils; leaflets scattered, membranaceous, not flaccid, ovate-lanceolate, acute, cuspidate, green above, pale beneath, shortly petiolulate, 3-5 cm. long; stipules large, ovate, subentire; peduncles shorter than the leaves; racemes mostly 7-13 flowered; pedicels as long as the calyx-tube; calyx wholly glabrous, the tube 5 mm. long, the two upper teeth short and broadly triangular, the lateral ones oblong-lanceolate, acute, as long as the tube, the ventral lobe longer and narrower; corolla 15 mm. long, pale ochroleucous but drying darker; pods linear, nearly straight, 3 cm. long, pendent; seeds globose, bright brown, the linear hilum nearly as long as the diameter.

Specimens examined:

Washington: Seattle, *Piper* No. 482 (type sheet 218,905 in U. S. National Herbarium); Olympia, *Henderson* No. 2348.

Oregon: Roseburg, *Cusick* No. 4159; Myrtle Point, *Holzinger* June 5, 1893; Antelope Creek, Jackson County, *Applegate* No. 2361.

This species occurs in open woodlands often with *L. polyphyllus* Nutt. It has been referred to both *L. sulphureus* Brewer and *L. ochroleucus*

Hook., but the former has coriaceous or subcoriaceous leaflets and ciliate calyx, while the latter has fewer leaflets always obtuse.

Lathyrus ochropetalus holochlorus, n. subsp.

Leaflets very thin, green on both sides; flowers cream-colored.

Hills south of Corvallis, Oregon, *H. C. Gilbert* No. 115, May 2, 1916. Type sheet No. 719,814 in U. S. National Herbarium.

Lathyrus peckii, n. sp.

Loosely pubescent throughout; stems slender, prominently angled, 60-90 cm. high; leaves with 2 or 3 widely separated pairs of leaflets, and well developed tendrils; stipules ovate, sinuate-dentate, acute at each end, the lower lobe only one-fourth as long as the upper; leaflets elliptic-lanceolate to broadly lanceolate, cuspidately acute, subacute at base, membranaceous, pubescent on both sides, paler beneath, 10-15 mm. long; peduncles exceeding the leaves about 5-flowered; pedicels pubescent as long as the calyx; calyx glabrous except the ciliation, the 2 upper teeth short, broadly triangular, the lateral and ventral much longer, lanceolate; corolla apparently violet, 15-18 mm. long; ovary puberulent; full grown pods linear 3-3.5 cm. long.

In thickets, Harbor, Curry County, Oregon, M. E. Peck No. 4008, July 31, 1913.

Seemingly unconnected with any described form, but simulating closely *L. lanceolatus* Howell, from which it differs in its fewer leaflets, broad stipules and marked pubescence.

Lathyrus coriaceus aridus, n. subsp.

Stems erect 20-30 cm. high, angled; stipules very narrow; leaflets linear to linear-lanceolate, 4-7 cm. long, finely puberulent on both sides; tendrils simple; flowers 9-12 mostly 10 mm. long; calyx puberulent or rarely glabrous.

The subspecies differs essentially from the species in its narrower leaflets, simple tendrils and smaller flowers.

Specimens have been examined as follows:

Washington: Falcon Valley, *Suksdorf* April 28, 1885.

Oregon: Black Butte, Crook Co., *Cusick* No. 2814; type, sheet 444,540 in U. S. National Herbarium. Squaw Creek, *Cusick* No. 2659; Farewell Bend, *Leiberg* No. 433; the calyx of this specimen glabrous, but the leaves puberulent.

California: Big Trees, Stanislaus Forest, *Eggleston* No. 9212; Yosemite National Park, *Hall* No. 8883; Rochester, *Parish* May 28, 1891; Quincy, *Heller* No. 10851; Wood Canon, Grapevine Mts., *Coville & Funston* No. 1760.

The last named specimen was published as *L. palustris* in the Botany of the Death Valley Expedition, and has larger flowers than any other specimen, namely 12 mm. long. Hall's specimen is said to have the corolla white, but rose-veined on the standard, and is labeled *L. graminifolius*

(Wats.) White, but that species has glabrous leaflets and calyx and appears not to reach California. The other specimens were unnamed.

In the original description of *Lathyrus oregonensis* White, Bul. Torr. Bot. Cl. 21:456, 1894, two specimens were cited. The first of these, Cusick's No. 1372 from Union County, Oregon, differs from the type of *L. coriaceus* White, namely Watson's No. 297 from the Wasatch Mts., Utah, only in having narrowly lanceolate leaflets. In pubescence and in floral characters the two are indistinguishable. The slight difference in the width of the leaflets is of no significance as evidenced by numerous recent specimens which form a complete connecting series.

The second specimen cited under the original description of *L. oregonensis* is from Falcon Valley, Washington, collected by Suksdorf April 28, 1885. On the sheet are three specimens, one with narrowly linear leaflets, the other two with narrow lanceolate or linear-lanceolate leaflets. In all the tendrils are simple and the flowers only 9 mm. long, smaller than those of the Cusick specimen.

Inasmuch as Cusick's Oregon specimen is cited first and the specific name is derived therefrom, it seems necessary to regard it as the type of *L. oregonensis*, though the author of the name wrote "type" on both sheets. The Cusick specimen is certainly the same thing as *L. coriaceus* White. The Suksdorf plant is distinguished by its very narrow leaflets, simple tendrils and smaller flowers, and is to be classed with the California specimens.

Lathyrus nuttallii lanceolatus, n. comb.

L. lanceolatus Howell Fl. N. W. America 158, 1898.

For the privilege of examining the type specimen collected at Glendale, Oregon, June 6, 1895, *Howell* No. 1923, I am indebted to Prof. A. R. Sweetser of the University of Oregon. In the original description Howell calls attention to the scattered dark glands on the stem. These glands are however not a specific character as they occur on most of the western species, even on *L. maritimus*. They may be found on any of the green parts but sometimes very sparingly. Each gland consists of an ellipsoid brown secreting cell borne on a shorter colorless stalk cell. In view of their general occurrence it is strange they have so generally been overlooked.

Howell's specimen is not exactly matched by any other examined. The outstanding features of the plant are the membranous oblong or oblong-lanceolate acute cuspidate leaflets and the sparse soft pubescence which occurs on the calyx, the upper part of the stem and on the under side of the leaflets; stipules lanceolate, subentire; ventral calyx tooth subulate not "setaceous"; corolla 15 mm. long.

In appearance the plant is closely matched by another Glendale specimen collected by M. E. Jones, June 19, 1902, but that is wholly glabrous except the ciliation of the calyx on which characters it would naturally be referred to *L. pauciflorus*.

Other specimens that closely approach Howell's type are the following, all referred to *L. nuttallii* Wats.:

Lake of the Woods, Oregon, *Coville & Leiberg* No. 48;

Klamath Valley, Oregon, *Cronkhite* No. 15;

Mount Rainier, Wash., *Flett* No. 1261;

Colby, Butte Co., Cal., *Mrs. R. M. Austin* No. 702.

On the whole we would consider *L. lanceolatus* at best a subspecies of *L. nuttallii.*

Lathyrus pauciflorus Fernald.

Lathyrus pauciflorus, like some other species of the genus, has both broad and narrow leafed variations. The latter especially have been very puzzling to students as evidenced by the numerous names which appear on the labels of specimens. Along with the variation of the leaflets there is a corresponding variation in the stipules, so that broad leaflets are usually associated with broad stipules and narrow leaflets with narrow stipules.

There is also wide variation in the size of the flowers, depending in part on where the plant grew. In normal plants of *L. pauciflorus* in Eastern Washington the flowers are about 20 mm. long, but in starved specimens from arid situations they are only 15 mm. long. It is evident therefore that the size of the corolla is a character whose value can easily be exaggerated. In general, however, the Mexican and Arizonan forms of the species as here interpreted have for the most part smaller flowers than the northern forms.

From a study of the extensive series of material which has accumulated in the National Herbarium it seems most logical to consider *L. pauciflorus* a variable species and to include in it as subspecies the plants described under the names *L. parvifolius* Watson, *L. utahensis* Jones, *L. pauciflorus tenuior* Piper and *L. brownii* Eastw. The principal distinguishing characters are displayed in the following key:

Flowers usually 18-20 mm. long.

Leaflets linear to linear-lanceolate ..... *L. pauciflorus tenuior.*

Leaflets broader.

Leaflets elliptic to ovate-lanceolate, acute..... *L. pauciflorus.*

Leaflets oval to ovate, obtuse..... *L. pauciflorus utahensis.*

Flowers 12-16 rarely 20 mm. long.

Leaflets oval, elliptic or ovate..... *L. pauciflorus schaffneri.*

Leaflets linear to narrowly-oblong..... *L. pauciflorus brownii.*

In the cases of *tenuior* and *utahensis* there is scarcely room to question their merely subspecific rank, as the differences are slight and the intergrades numerous.

As regards *schaffneri* the case is more complex, as there is wide variation both in the form of the leaflets and in the size of the flowers. Among Mexican specimens, Pringle's No. 8810 might well be referred to typical

pauciflorus both on account of the size of the flowers and the form of the leaflets, while Purpus No. 3893 has the leaflets, of *utahensis* and the flowers a mere trifle smaller. On geographical grounds alone it would seem most probable that these two plants are merely extreme forms of *schaffneri*, and not southern extensions of the northern forms they so closely simulate. In exactly the opposite way starved forms of *pauciflorus* in Oregon and Washington become indistinguishable from the normal form of *schaffneri* as it occurs in Arizona and California. *Lathyrus brownii* is more variable in leaf form than its larger-flowered analogue *tenuior*, but it intergrades completely into *schaffneri*.

It would seem clear therefore that we have to deal with a widespread species possessing definite variations but also subject according to the environment to fluctuating variations that closely simulate the real variations. Any other interpretation makes it necessary either to provide additional names for some of the forms discussed or else involves the acceptance of overlapping or inconsistent geographical distribution.

Lathyrus pauciflorus Fernald Bot. Gaz. 19:335. 1894.

L. bradfieldianus A. Nelson Bot., Gaz. 54:411. 1912.

The typical form of this species occurs mainly in Washington, Oregon and Idaho, but it extends to Colorado. Normally the leaves are subcoriaceous in texture, but in shade plants, especially from west of the Cascade Mountains, are merely firm membranaceous. The type specimen in the Gray Herbarium is Piper No. 1487, from near Almota, Wash.

Specimens examined:

Washington: Wawawai, *Piper* May 1896;
Almota, *Piper* No. 2797, *Elmer* No. 308;
Waitsburg, *Horner* May 1, 1897;
Blue Mts., *Horner* No. 152;
Western Klickitat County, *Suksdorf* No. 854;
Near Wenache, *Whited* Nos. 1266, 1106, the latter approaching *tenuior;*
Without locality, *Vasey* No. 257;
Upper Nesqually Valley, *Allen* No. 132;
Port Townsend, *Wilkes Exped.*, with unusually thin leaves.

Oregon: Blue Mts., *Howell* May 20, 1885;
Glendale, *M. E. Jones* June 19, 1902;
Trow, Wallowa Forest, *Jardine* No. 238, a form approaching *tenuior.*

Idaho: Lower Clearwater River, *Sandberg, MacDougal & Heller* Nos. 74 and 74a, the latter approaching *tenuior;*
Juliaetta, *Henderson* No. 2738;
Silver City, *Macbride* No. 927, type collection of *L. bradfieldianus.*

Colorado: Mountains east of Gunnison, *L. F. Ward* No. 295, cited in the original description of *L. utahensis* Jones.

Lathyrus pauciflorus utahensis, n. comb.

L. utahensis Jones Proc. Cal. Acad. Sci. n. ser. 2:678. 1895.

Apparently the only character to separate this from the species is that the leaflets are broader and obtuse, but mucronate as in typical *pauciflorus*.

The following specimens are in the National Herbarium:

Utah: Ireland's Ranch, *Jones* No. 5441 l (Duplicate type);
City Creek Canon, *Jones* No. 1740;
Red Rock Canon near Salt Lake City, *Rydberg* No. 6110;
Manti National Forest, *J. A. Willey*, June 6, 1912;
Near Salt Lake City, *Garrett* No. 229. This and the preceding are thin-leaved apparently shade plants.

Arizona: Northern end of Carrizo Mts. *Standley* Nos. 7383, 7409; the specimens in fruit.

Colorado: Parrott, *Baker, Earle & Tracy* No. 616;
Lone Mesa, Montezuma Co., *Cary* No. 196;

Oregon: Mountains near North Pine Creek, *Cusick* No. 2538;
Union County, *Cusick* No. 756, distributed as *L. bolanderi* Wats.

Washington: Walla Walla, *Shear* No. 1614.

In the original description, Jones cited Ward's No. 295 from mountains east of Gunnison, Colo., but the specimen of this number in the National Herbarium seems clearly typical *L. pauciflorus*. Cusick's No. 2538 was cited under the original description of *L. bradfieldianus* A. Nels.

Lathyrus pauciflorus tenuior Piper Contr. U. S. Nat. Herb. 11:378. 1906.

L. parvifolius tenuior Piper Fl. Palouse Region 108. 1901.
L. tenuior Rydb. Fl. Rocky Mts. 528. 1917.

This subspecies has linear or lance-linear leaflets, but a complete series of forms connects it with the species. Here belong the following specimens:

Washington: Almota, *Elmer* No. 52 (type);
Wenas, *Griffiths & Cotton* No. 86;
Wenache Mts., *Griffiths & Cotton* No. 129;
Horse Lake west of Wenache, *Whited* No. 1107;
Without locality, *G. R. Vasey* No. 258.

Oregon: Blue Mts., *Sheldon* No. 153;
Lost Prairie, Wallowa County, *Cusick* No. 2408;
Cottonwood Creek, Lake County, *Eggleston* No. 7108;
Rock Creek, Morrow County, *Leiberg* No. 77;
Ochoco National Forest, *Ingram* May 10, 1912.

Idaho: Little Potlatch River, *Sandberg, Heller & MacDougal* No. 383.

Lathyrus pauciflorus schaffneri, n. comb.

L. parvifolius Wats. Proc. Am. Acad. 17:345. 1882. Not Roth 1797.
L. schaffneri Rydb. Mem. N. Y. Bot. Gard. 1:258. 1900.

The original specimen on which *L. parvifolius* Wats. is based was col-

lected in the San Miguelito Mts., San Luis Potosi, Mexico, by Schaffner. There are 10 sheets from Mexico in the National Herbarium which agree closely with the original description. The Mexican specimens are all rather tall plants with well developed tendrils, oval to ovate, acute or obtuse leaflets, and resemble *L. pauciflorus* very closely, but the flowers are nearly always slightly smaller, namely 12-18 mm. long, except in Pringle's specimen from Melepec, which has flowers 20 mm. long. Most of the Arizona and California specimens are dwarfed, being usually 15-25 cm. high with the leaflets mostly oval usually acute and the flowers 12-15 mm. long. Similar dwarfed specimens from as far north as Oregon, Klamath Falls, *Applegate* No. 2050, and Washington, Wenache Mts., *Cotton* No. 1275, agree well with the Arizona plants, but there seems every reason to believe that they are merely starved plants of *L. pauciflorus*, as dwarfing in other species also affects the size of the corolla. In the absence of any other distinguishing character, it seems most logical to reduce *L. schaffneri* to subspecific rank.

The following specimens are in the National Herbarium:

Mexico: Cerro Verde, Oaxaca, *Purpus* No. 3226;
Melepec, Hidalgo, *Pringle* No. 8818;
Pachuca, Hidalgo, *Pringle* No. 7640;
San Luis Potosi, *J. G. Schaffner* No. 608; *Parry & Palmer* No. 197;
Chuichupa, Chihuahua, *Barber & Townsend*, July 17, 1899;
State of Durango, *Rose* No. 2335;
El Oro to Guanacevi, Durango, *Nelson* No. 4742;
Cerro de Chicamole, Puebla, *Purpus* No. 3893;
Alvarez, San Luis Potosi, *Palmer* No. 66.
The last three specimens have the leaflets broad and obtuse, thus resembling *utahensis*.

Arizona: Massatzal Mts., *Dr. Smart* No. 175;
San Francisco Mts., *MacDougal*, June 1891;
Without locality, *Palmer* in 1869.

New Mexico: Carrizo Mts., *Dr. W. Matthews* in 1892.

Colorado: Without locality, *Eastwood* No. 4;
Clear Creek, *Wolf* No. 187.

California: Oro Fino, Sisykou Co., *Butler* No. 1212;
Water Canon, Tehachapi Mts., Kern Co., *Abrams & McGregor* No. 443, both narrow, and broad-leafed forms on same sheet; the narrow-leaved plants match well the type collection of *L. brownii*.

Lower California: Without locality, *Palmer* No. 89 in 1888.

Lathyrus pauciflorus brownii, n. comb.

L. brownii Eastw. Bul. Torr. Bot. Cl. 30: 491. 1903.

This plant closely simulates *tenuior*, but the flowers are smaller and the leaflets even more variable. On small plants, as some of those of the type collection, the tendrils are simple and much reduced.

Specimens Examined:

California: Mt. Shasta, *Brown* No. 391 (type collection). Plants 15-30 cm. high, Leaflets narrowly oblong to linear, 2-3 cm. long, 2-5 mm. wide.

Mt. Eddy, *Heller* No. 12096. Plant 60 cm. high; leaflets 2-4 cm. long, 2-7 mm. wide.

Water Canyon, Tehachapi Mts., *Abrams & McGregor* No. 443; both narrow and broad-leafed forms on the same sheet, the latter referred to *schaffneri*. The narrow-leafed forms match exactly some of the plants of the type collection of *brownii*.

Castella, *Piper* No. 6367;

Butte Co., *Mrs. R. M. Austin* No. 1169;

Greenhorn Mts., Siskyou Co., *G. D. Butler* No. 1346.

The last three specimens have narrowly linear leaflets, 2-6 cm. long and 1.5-2 mm. wide. The pods on *Piper* No. 6367 and *Austin* No. 1169 are broadest above the middle as also in *Abrams & McGregor* No. 443. This character may be of deeper significance, which only good complete material will disclose.

Oregon: Swan Lake Valley, *Applegate* No. 147;

Klamath River, *Applegate* No. 2073;

Friend, Wasco Co., *C. E. Hill* June 29, 1917.

All the Oregon specimens have narrowly linear leaflets 2-5 cm. long, 2-4 mm. wide.

Arizona: China Valley, *Toumey* No. 550;

Oracle, *M. E. Jones* Aug. 28, 1903;

Flagstaff, *MacDougal* No. 41;

Black Mesa Forest Reserve, on Apache-Verde road, *Coville* No. 1073.

These Arizona specimens were labelled *L. arizonicus* Britt. and *L. graminifolius* White. The leaflets are from 5-7 cm. long and 1.5-3 mm. wide.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW *IOLE* FROM THE ANAMBA ISLANDS.

BY HARRY C. OBERHOLSER.

A specimen of *Iole olivacea* from the Anamba Islands has recently come to light in the collection of the United States National Museum. When the writer reported on the collection made by Dr. W. L. Abbott on these islands in 1899* this particular bird was not to be found. It adds a genus as well as a species to the fauna of the Anamba group, making altogether 57 species and subspecies of birds now known from this archipelago.

Iole olivacea crypta, subsp. nov.

Chars. subsp.—Similar to *Iole olivacea olivacea*, from the Malay Peninsula, but upper parts darker.

Description.—Type, adult male, No. 171,079, U. S. Nat. Mus.; Pulo Jimaja, Anamba Islands, South China Sea, September 22, 1899; Dr. W. L. Abbott. Pileum olive brown, slightly and obscurely streaked with a darker shade; remaining upper surface between olive and brownish olive, rather lighter and more rufescent on the rump, and passing on the upper tail-coverts into a brown between Prout's brown and mummy brown; tail olive brown, the outer margins of the feathers olivaceous; wings fuscous, the inner edges of secondaries and of the basal portion of the primaries dull cartridge buff, the edgings of the outer webs of primaries and secondaries, together with those of the tertials and greater wing-coverts, rather light brownish olive, the median and lesser wing-coverts like the back; lores and a very narrow superciliary stripe, olive buff; cheeks and auriculars, between dark olive buff and citrine drab; a narrow postocular stripe olive brown; a horizontal stripe above the last, of the same color as the cheeks, but duller and darker; sides of the neck like the back; chin and throat rather yellowish deep olive buff; jugulum and upper breast, between deep olive buff and dark olive buff, broadly, though obscurely,

* Bull. U. S. Nat. Mus. No. 98, June 30, 1917, pp. 1–75.

streaked with citrine drab; lower breast between primrose yellow and colonial buff; abdomen marguerite yellow; sides and flanks, citrine drab; lower tail-coverts dull chamois, the centers of the feathers light brownish olive; thighs citrine drab; lining of wing colonial buff; "iris gray; upper mandible dark horn brown; lower mandible pale leaden; feet fleshy brown."

Measurements of type.—Total length (in flesh) 94 mm.;* wing, 90; tail, 81; exposed culmen, 16; tarsus, 19; middle toe without claw, 12.5.

Geographic distribution.—Anamba Islands to Sumatra.

Remarks.—This new race is similar also to *Iole olivacea charlottae* from Borneo†, but is less rufescent and somewhat paler above, as well as less rufescent and less deeply yellowish below. Birds from Sumatra appear to be identical with *Iole olivacea crypta*, though they vary somewhat individually.

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* Measured by the collector.

† *Criniger charlottae* Finsch. Journ. f. Ornith., XV, No. 1, January, 1867, p. 19 (Borneo).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THREE NEW PHILIPPINE ISLAND LAND SHELLS.

BY PAUL BARTSCH.*

Among a sending of land shells from Palawan and the adjacent islands, transmitted to the U. S. National Museum for determination, are three new forms that require names, which are here bestowed.

Camaena trailli weberi, new subspecies.

This race strongly resembles *Camaena trailli bugsukensis* in outline and coloration but is a giant in comparison. The two specimens before me, Cat. No. 219,056, U. S. N. M., were collected by Mr. Weber at Bulilikan, on the extreme tip of southern Palawan. They yield the following measurements:

Nepionic whorls	Post nepionic whorls	Altitude	Greater Diameter	Lesser Diameter
2.2	3.0	51.7	54.0	42.0 Type
2.4	3.0	48.1	53.5	42.4

The second specimen is considerably paler than the first and the median band on the upper surface of the whorls is less pronounced. When compared with *Camaena trailli trailli* Pfr., which is said to have come from Palawan Passage (the specific island is not yet known), it is at once distinguished by the much weaker axial sculpture, which consists of mere lines of growth. In *Camaena trailli trailli* this is specialized into slender irregularly disposed wavy retractively slanting threads.

Mr. Weber states that these mollusks are found crawling on trunks of trees during rainy weather, seldom near the sea, and that specimens from the foothills grow larger than those of lower levels.

* Published by permission of the Secretary of the Smithsonian Institution.

Camaena trailli bugsukensis, new subspecies.

This, the smallest known race of *Camaena trailli,* comes from the island of Bugsuk off southeastern Palawan. Three specimens donated to the U. S. National Museum, Cat. No. 219,055, from this locality, yield the following measurements:

	Nepionic whorls	Postnepionic whorls	Altitude	Greater Diameter	Lesser Diameter
1	2.3	2.4	35.2	38.8	32.0 Type
2	2.4	2.4	33.6	38.5	32.3
3	2.2	2.7	36.2	41.8	33.1

The present race is a brightly colored one. The upper surface of the whorls has the usual brownish surface. All the three specimens before me have a narrow dark brown band at the summit and another of the same shade of about double the width, at the periphery, the latter being flanked on each side by a light zone as wide or wider than the dark band. Number one has a broad band paler than the peripheral, but almost as wide, in the space between the peripheral band and that at the summit. This is not quite median but a little nearer the periphery than the summit. In number two this band is absent while in number three it is reduced to a narrow line. All three have a dark basal band about three times as wide as the peripheral and of the same shade as that. The pale space between the peripheral dark band and the basal is a little wider than the peripheral zone. The anterior half of the base is buff. The peristome of the aperture is a little darker than the dark brown color bands. The inner edge of the columella at its insertion is bluish.

Mr. Weber states that these mollusks were found clinging to leaves and on trunks of trees and that they hide in hollow trees and crevices during dry weather.

Cochlostyla palavanensis bancalanensis, new subspecies.

Four shells collected by Mr. Weber at Bancalan Island are sufficiently distinct from any of the known races of *Cochlostyla palavanensis* to merit a trinomial designation. They have the apical whorls livid pink; in the *Cochlostyla palavanensis palavanensis* they are usually white. The whorls are uniformly more inflated with the aperture comparatively larger and more flaring than in *Cochlostyla palavanensis palavanensis.*

The narrow dark band at the suture in *Cochlostyla palavanensis palavanensis* is wanting here or only indicated by a line of small dark spots. There are two color phases of this subspecies in the sending of which Mr. Weber states: Col. 027, Cat. No. 219,046, U. S. N. M. "Found crawling on trunks of trees and clinging to leaves of bushes from within

a few feet of the sea to the center of the island." This is the dark colored phase in which the ground color of the last whorl is chocolate brown and the interior decidedly blue. Col. No. 028, Cat. No. 219,047, U. S. N. M., has the ground color of the last whorl buff and the interior pale blue. Of this Mr. Weber says that it has the same habit as the last, but is very rare.

The four specimens yield the following measurements:

Cat. No. U. S. N. M.	No. whorls	Altitude	Greater Diameter	Lesser Diameter
219046	5.5	45.8	29.2	25.0 Type
219046	5.5	46.0	27.8	24.3
219047	5.5	43.7	27.2	23.3
219047	5.8	44.0	25.9	22.5

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE STATUS OF THE GENUS ORCHILUS CABANIS.

BY HARRY C. OBERHOLSER.

The generic name *Orchilus* Cabanis was first proposed in 1845 for a genus of South American Tyrannidae.* It originally included the following four species: (1) *Euscarthmus cinereicollis* Maximilian=*Orchilus auricularis* (Vieillot); (2) *Euscarthmus superciliaris* Maximilian=*Habrura pectoralis* (Vieillot); (3) *Orchilus pileatus* Cabanis=*Lophotriccus squamaecristus* (Lafresnaye); (4) *Orchilus rufipes* Cabanis. No type is mentioned in the original description, but by common consent it seems to have been, up to the present time, universally regarded as *Platyrhynchus auricularis* Vieillot. The earliest designation of a type for *Orchilus* Cabanis seems to be that of Gray in 1855,† who selected *Orchilus pileatus* Cabanis, which, as above indicated, is the same as *Todirostrum squamaecristum* Lafresnaye. This consequently makes the generic name *Orchilus* Cabanis identical in application with *Lophotriccus* Berlepsch.‡ Fortunately for the name *Lophotriccus*, however, *Orchilus* Cabanis is preoccupied by *Orchilus* Morris,§ and is, therefore, automatically disposed of in the synonymy of *Lophotriccus*.

This leaves the present genus *Orchilus* without a name, since

* Fauna Peruana, Aves, 1845, pp. 24, 164.

† Cat. Gen. and Subgen. Birds, 1855, p. 50.

‡ Proc. Zool. Soc. Lond., 1883, p. 553 (Type, *Todirostrum spicifer* Lafresnaye).

§ *Orchilus* Morris, The Naturalist (ed. Neville Wood), III, No. 9, June, 1837, p. 124. This genus, of which no type was originally mentioned, contained two species—*Orchilus cristatus*=*Regulus cristatus* Koch=*Motacilla regulus* Linnaeus; and *Orchilus ignicapillus*=*Sylvia ignicapilla* Temminck. Neither of these species has yet been selected as the type of *Orchilus* Morris, and since this name must now apparently be used in place of *Regulus* Cuvier, for *Motacilla regulus* Linnaeus and its allies (*cf.* Richmond, Proc. U. S. Nat. Mus., LIII, 1917, p. 620), we hereby designate *Sylvia ignicapilla* Temminck (Brehm MS.) as the type of *Orchilus* Morris.

Perissotriccus Oberholser,* proposed for *Orchilus ecaudatus* (Lafresnaye) and *Orchilus atricapillus* (Lawrence), is generically distinct from *Orchilus auricularis* (Vieillot) and *Orchilus albiventris* Berlepsch and Stolzmann. Mr. C. E. Hellmayr has recently stated† that *Orchilus albiventris*‡ is intermediate between *Orchilus auricularis and Orchilus ecaudatus,* the type of *Perissotriccus,* and therefore that the genus *Perissotriccus* is invalid. A careful examination of the species in question shows, however, that *Orchilus albiventris* has structural proportions identical with *Orchilus auricularis,* being, moreover, very much like it in color, and, therefore, is strictly congeneric, not by any means intermediate between it and *Perissotriccus ecaudatus.* This may be readily verified by reference to the original diagnosis of *Perissotriccus* Oberholser§ and the measurements of the species in question. Since the two species, *Orchilus auricularis* and *Orchilus albiventris,* which form the present genus *Orchilus* after the removal of the species of *Perissotriccus,* are thus without a generic designation, we here propose for them the name **Notorchilus,**** and designate as its type *Platyrhynchus auricularis* Vieillot.

By this arrangement the species heretofore included in the genus *Orchilus* Cabanis will stand as follows:

Notorchilus auricularis auricularis (Vieillot).
Notorchilus auricularis pyrrhotis (Berlepsch).
Notorchilus albiventris (Berlepsch & Stolzmann).
Perissotriccus ecaudatus (D'Orbigny & Lafresnaye).
Perissotriccus atricapillus (Lawrence).

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* Proc. U. S. Nat. Mus., XXV, Aug. 30, 1902, p. 64.

† Novit. Zool., XIII, No. 1, February, 1906, p. 22.

‡ *Orchilus albiventris* Berlepsch and Stolzmann, Ibis, series 6, VI, No. XXIII, July, 1894, p. 389 (La Merced, east central Peru).

§ Proc. U. S. Nat. Mus., XXV, August 30, 1902, p. 64.

** νότος, meridies; ὀρχίλος, regulus.

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